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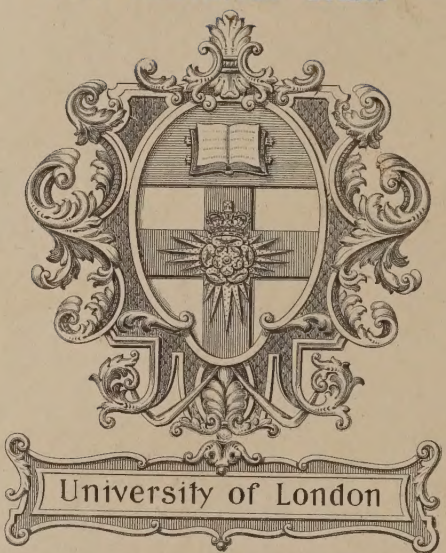

REPORTS

FROM

COMMITTEES:

ELEVEN VOLUMES.

—(8.)—

MERCANTILE LAW AMENDMENT;
METROPOLIS TURNPIKE ROADS;
NEW WESTMINSTER BRIDGE;
ORDNANCE SURVEY (SCOTLAND);
PUBLIC OFFICES.

Session

31 *January* —— 29 *July* 1856.

VOL. XIV.

1856.

REPORTS FROM COMMITTEES:

1856.

ELEVEN VOLUMES:—CONTENTS OF THE

EIGHTH VOLUME.

N.B.—*THE* Figures *at the* beginning of the line, *correspond with the* N° *at the foot of each* Report; *and the* Figures *at the* end of the line, *refer to the* MS. Paging *of the Volumes arranged for The House of Commons.*

MERCANTILE LAW AMENDMENT:

294. REPORT from the Select Committee of the HOUSE of LORDS, on the MERCANTILE LAW AMENDMENT BILL (on Re-commitment); together with the PROCEEDINGS of the COMMITTEE, and MINUTES of EVIDENCE - - - - - - - - - - - p. 1

METROPOLIS TURNPIKE ROADS:

333. REPORT from the Select Committee on METROPOLIS TURNPIKE ROADS; together with the PROCEEDINGS of the COMMITTEE, MINUTES of EVIDENCE, APPENDIX, and INDEX - - - - - - 79

NEW WESTMINSTER BRIDGE:

389. REPORT from the Select Committee on NEW WESTMINSTER BRIDGE; together with the PROCEEDINGS of the COMMITTEE, MINUTES of EVIDENCE, APPENDIX, and INDEX - - - - - - 225

ORDNANCE SURVEY (SCOTLAND):

198. REPORT from the Select Committee on ORDNANCE SURVEY of SCOTLAND; together with the PROCEEDINGS of the COMMITTEE, MINUTES of EVIDENCE, APPENDIX, and INDEX - - - - 361

PUBLIC OFFICES:

368. REPORT from the Select Committee on PUBLIC OFFICES; together with the PROCEEDINGS of the COMMITTEE, MINUTES of EVIDENCE, and APPENDIX - - - - - - - - - - 533

MERCANTILE LAW AMENDMENT:

REPORT - - - - - - - - - - - - p. 3
PROCEEDINGS - - - - - - - - - - 5
MINUTES OF EVIDENCE - - - - - - - - 9

METROPOLIS TURNPIKE ROADS:

REPORT - - - - - - - - - - - - 81
PROCEEDINGS - - - - - - - - - - 82
MINUTES OF EVIDENCE - - - - - - - - 85
APPENDIX - - - - - - - - - - - 193
INDEX - - - - - - - - - - - - 205

NEW WESTMINSTER BRIDGE:

REPORT - - - - - - - - - - - - 227
PROCEEDINGS - - - - - - - - - - 229
MINUTES OF EVIDENCE - - - - - - - - 233
APPENDIX - - - - - - - - - - - 308
INDEX - - - - - - - - - - - - 343

ORDNANCE SURVEY (SCOTLAND):

REPORT - - - - - - - - - - - - 363
PROCEEDINGS - - - - - - - - - - 371
MINUTES OF EVIDENCE - - - - - - - - 381
APPENDIX - - - - - - - - - - - 495
INDEX - - - - - - - - - - - - 507

PUBLIC OFFICES:

REPORT - - - - - - - - - - - - 535
PROCEEDINGS - - - - - - - - - - 539
MINUTES OF EVIDENCE - - - - - - - - 541
APPENDIX - - - - - - - - - - - 569

Brought from the Lords, 17 *June* 1856.

REPORT

FROM THE

SELECT COMMITTEE OF THE HOUSE OF LORDS,

ON THE

MERCANTILE LAW AMENDMENT BILL [H. L.]

(On Re-commitment);

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

AND

MINUTES OF EVIDENCE.

Session 1856.

Ordered, by The House of Commons, *to be Printed,*
18 *June* 1856.

REPORT - - - - - - - - - - - p. iii

PROCEEDINGS OF THE COMMITTEE - - - - - - p. v

MINUTES OF EVIDENCE - - - - - - - - p. 1

REPORT.

BY THE LORDS COMMITTEES appointed a SELECT COMMITTEE, to whom was referred back the MERCANTILE LAW AMENDMENT BILL, and to report to The House; and to whom was referred a PETITION of the CHAMBER OF COMMERCE and MANUFACTURES at MANCHESTER in favour of the said Bill:—

ORDERED TO REPORT,

THAT the Committee have met, and again considered the said Bill, and have examined several Witnesses in relation thereto; and have directed the MINUTES OF EVIDENCE taken before them to be laid before your Lordships.

And the Committee have gone through the Bill, and directed the same to be reported to your Lordships, with an Amendment.

2d June 1856.

LORDS PRESENT, AND MINUTES OF PROCEEDINGS AT EACH SITTING OF THE COMMITTEE.

Die Mercurii, 21° *Maii* 1856.

PRESENT:

Lord Chancellor.	Lord Stanley of Alderley.
Lord Privy Seal.	Lord Overstone.
Earl Grey.	

The LORD CHANCELLOR in the Chair.

Order of Reference read, referring back the Bill to the same Select Committee to which the said Bill was formerly referred.

Order read, referring to the Committee a Petition of the Directors of the Chamber of Commerce and Manufactures at Manchester, in favour of the said Bill.

The said Petition is read.

The following Witnesses are called in, and severally examined, and are directed to withdraw, viz.: *James William Freshfield*, Esq., *Thomas Matthias Weguelin*, Esq., *Germain Lavie*, Esq., Baron *Lionel Nathaniel de Rothschild*, *Daniel Meinertzhagen*, Esq., *John Jellibran Hubbard*, Esq., *John Cattley*, Esq. (*Vide* the Evidence.)

Ordered, That this Committee be adjourned until Tuesday next, Three o'clock.

Die Martis, 27° *Maii* 1856.

PRESENT:

Lord Chancellor.	Lord Wrottesley.
Lord Privy Seal.	Lord Stanley of Alderley.
Earl Grey.	Lord Overstone.
Lord Ardrossan.	

The LORD CHANCELLOR in the Chair.

Order of Adjournment read.

The Proceedings of the Committee of Tuesday last are read.

The following Witness is called in, and examined, and directed to withdraw, viz.: *John Hollams*, Esq. (*vide* the Evidence); and *George Moffatt*, Esq., a Member of the House of Commons, attending, is examined, and withdraws (*vide* the Evidence).

Ordered, That this Committee be adjourned until To-morrow, half past Two o'clock.

Die Mercurii, 28° *Maii* 1856.

PRESENT:

Lord Privy Seal.	Lord Stanley of Alderley.
Earl Grey.	Lord Overstone.
Lord Wrottesley.	

In the absence of the Lord Chancellor, it is moved to resolve, that the Lord Stanley of Alderley do take the Chair.

The same is agreed to, and the Lord Stanley of Alderley takes the Chair.

Order of Adjournment read.

The Proceedings of the Committee of yesterday are read.

The following Witnesses are called in, and severally examined, and are directed to withdraw, viz.: Professor *Leone Levi*, *James Marshall Brookes*, Esq. (*Vide* the Evidence).

Ordered, That this Committee be adjourned until Friday next, Four o'clock.

Die Veneris, 30° *Maii* 1856.

PRESENT:

Lord Chancellor.	Lord Stanley of Alderley.
Lord Privy Seal.	Lord Overstone.
Earl Grey.	

The LORD CHANCELLOR in the Chair.

Order of Adjournment read.

The Proceedings of the Committee of Wednesday last are read.

The Title of the Bill is read, and postponed.

The Preamble is read.

Clause 1 is read, and considered.

Then it was moved by the Lord *Overstone* to resolve, "That the Committee have examined several witnesses on the subject of the said Clause of the Bill, by which it is proposed to alter the law with respect to contracts by dispensing with the necessity which now exists for some written memorandum in order to give validity to contracts beyond the value of 10 *l.*; that different opinions have been expressed by these witnesses as to the expediency of retaining this Clause in the Bill, but the Committee, on full consideration, have come to the conclusion that it ought to be omitted, for the following reasons:—

"Because it involves an unnecessary disturbance of the existing state of the law in this country, upon which a long and well-established course of commercial usage has been founded.

"Because it is uncalled for by any adequate necessity, or any strong sense of practical inconvenience. The English law on the subject of mercantile contracts had not been complained of previous to the appointment of the Mercantile Law Commission. No remonstrance against the practical inconvenience of the law had been presented to Parliament, to the Government, or in any other public or official form. The proposed change appears to have emanated entirely from an abstract desire to assimilate the laws of England and Scotland.

"Because the recommendation of the change of law has not been preceded on the part of the Commissioners by any sufficient examination of the nature and course of commercial transactions, nor by any adequate consultation with the mercantile body. There exists a feeling of universal surprise and regret that a change of the law affecting transactions so numerous, and of such magnitude, should have been introduced without their knowledge, causing, as stated in the Evidence, an equal feeling of astonishment and alarm throughout the body of merchants and traders in the City of London.

"Because it is contrary to the spirit which pervades the Bill on other subjects, by which greater, not less, stringency of proof is required, and none but written evidence is hereafter to be admitted of the acceptance of Bills of Exchange, or of the terms and purport of a guarantee, and it is equally inconsistent with the reasoning by which those recommendations are supported by the Commissioners in their Report.

"Because

"Because it is contrary to the principle on which commercial legislation ought to be founded, viz., that of confirming and giving legal validity to commercial usages, the long existence of which affords strongly presumptive evidence of their reasonableness and safety. Whereas, the proposed change of law is an attempt to force extensive commercial usage out of its settled channel, and to compel it to assume a new shape and direction, in obedience to an arbitrary change of the law.

"Because the present law, which it is proposed to abolish, prevails not only in England but in all her colonial possessions, with very slight exception; and also throughout the United States, with the single exception of Louisiana; in Hamburgh, Leipsic, and other continental towns: these constituting the great commercial countries of the world.

"Moreover, in the most important and wealthy states of the continent, especially France, parol proof of contracts is admitted only permissively, that is, in those cases only in which it may appear to the satisfaction of the judge that it may be received with propriety and safety; this very restriction giving indirect, but unequivocal testimony to the predominant feeling in those countries of the treacherous and dangerous nature of such evidence, and of the necessity of receiving it with great caution, and of admitting it in special cases only.

"Because it is contrary to the plain principle so clearly laid down by Mr. Blair, the manager of the Bank of Scotland (p. 79), respecting the admission of parol evidence, viz., 'Parol evidence should be admitted only in cases perfectly simple and well defined, and in which the terms cannot be easily mistaken.'

"Because it is contrary to the instinctive dictates of common sense and universal practice in the ordinary affairs of life, which seeks the certainty of written documents in proportion as the subject is important, and ambiguity or misunderstanding become seriously inconvenient.

"Because it is contrary to the emphatic protest of the body of merchants, of the wholesale dealers, of the traders at large, of the principal bankers, and of some of the most important solicitors of the City of London.

"The Chamber of Commerce of Liverpool has recorded its opinion against the Clause

"The Committee of Traders for the Amendment of the Law of Debtor and Creditor,—the only body, be it observed, connected with the mercantile interests of the City of London whom the Commissioners consulted,—decided by a large majority against the proposed alteration.

"And Mr. Hill, the Recorder of Birmingham, and Commissioner of Bankruptcy in Bristol, who must therefore have great practical knowledge of the course of transactions in a great inland town and in a port such as Bristol, and who is, moreover, well known as an earnest though cautious and discreet advocate of law reform, has recorded his opinion in favour of the English law which it is proposed to repeal, in preference to the Scotch law which it is proposed to substitute for it.

"Because the legal authority and bias in favour of the proposed clause is founded on an incomplete and inaccurate knowledge of the practical course of mercantile and trading transactions, leading to contracts, especially at out-ports, as distinguished from inland towns, and of the consequent inconvenience, danger, and injury which the clause must entail. These practical considerations can only be estimated by those who are personally acquainted with the course and conduct of business. Lawyers may be the best interpreters of what the law is, but merchants and traders are the best judges of what the law ought to be in matters of commerce and trade.

"Because the inconvenience arising from the non-validity of verbal contracts is susceptible of easy correction by the reasonable, and in most cases desirable expedient of written contracts. The omission to resort to such written contracts seems to indicate that the invalidity of parol contracts is not found to be a very pressing evil; whilst the statement of some of the witnesses, that the buyers in many cases will not enter into written contracts, seems to indicate a settled purpose on the part of one of the parties not to enter into a binding contract; and in such case to hold him to a binding contract by parol evidence would be a practical instance, in one form, of the very injustice which is apprehended under the proposed law.

"On the other hand, there can be no resource or adequate protection to merchants against the danger they apprehend of having the loose conversations which must be preliminary to any final agreement upon complicated transactions imposed upon them as binding contracts, through the force of mere parol evidence not resting upon the basis of any written memorandum."

Objected to. Upon question,

Contents.	Not Contents.
Earl Grey.	Lord Chancellor.
Lord Overstone.	Lord Privy Seal.
	Lord Stanley of Alderley.

The said Clause is then agreed to.

The Clauses of the Bill to Clause 10 inclusive are read, and agreed to.

Clause 11 is read.

On the question that the said Clause stand part of the Bill, resolved in the negative.

The remaining Clauses of the Bill are read, and agreed to.

The Preamble is again read, and agreed to.

The Title is again read, and agreed to.

Ordered, That the Bill be reported, with the Amendment.

MINUTES OF EVIDENCE.

LIST OF WITNESSES.

Die Mercurii, 21° *Maii* 1856.

	PAGE
James William Freshfield, Esquire - - - - -	3
Thomas Matthias Weguelin, Esquire - - - -	19
Germain Lavie, Esquire - - - - - - -	29
Baron Lionel Nathaniel de Rothschild - - - -	32
Daniel Meinertzhagen, Esquire - - - - -	33
John Jellibran Hubbard, Esquire - - - - - and John Cattley, Esquire - - - - - - -	38

Die Martis, 27° *Maii* 1856.

John Hollams, Esquire - - - - - - -	41
George Moffatt, Esquire, M. P. - - - - -	53

Die Mercurii, 28° *Maii* 1856.

Professor Leone Levi - - - - - - -	59
James Marshall Brookes, Esquire - - - - -	66

Die Mercurii, 21° Maii 1856.

LORDS PRESENT:

Lord Chancellor.	Lord Stanley of Alderley.
Lord Privy Seal.	Lord Overstone.
Earl Grey.	

THE LORD CHANCELLOR in the Chair.

The following Witnesses are called in, and severally examined; viz., James William Freshfield, Esquire; Thomas Matthias Weguelin, Esquire; Germain Lavie, Esquire; the Baron Lionel Nathaniel de Rothschild; Daniel Meinertzhagen, Esquire; John Jellibran Hubbard, Esquire, and John Cattley, Esquire.

JAMES WILLIAM FRESHFIELD, Esquire, is examined as follows:

1. Lord *Overstone.*] I believe you are solicitor to the Bank of England?
I am.

2. You are also largely engaged in professional business in connection with important leading mercantile houses in the City?
I am.

3. In the discharge of that business, are there frequently brought under your cognizance a variety of transactions of mercantile houses, both of your own clients and of those with whom they deal?
There are.

4. Does it come within your experience on many occasions to have to consider the nature of contracts made by merchants *inter se*, and also contracts made for them by intermediate agents?
Very frequently, to a very considerable extent.

5. The established usage conformable to law at present throughout the City, is that those contracts have no binding force unless they are reduced to writing?
That is the operation of the law at the present moment; those contracts are all required to be in writing, and to be signed by the parties.

6. Have you ever heard any complaint of inconvenience or evil arising from that universal practice?
Not on the part of merchants at all; quite the contrary; I have always heard it considered as being essential to the maintenance of the dealings of the City of London.

7. Does the law require any particular form of writing to make the contract binding, or merely that it shall be in some form or other in writing?
It must be in some form of writing, signed by the party to be charged, or their agents.

8. Is it consistent with your own impression that the present practice works well and safely for the mercantile community?

J. W. Freshfield, Esq.

21st May 1856.

I am quite certain that it works well and safely for the mercantile community, and I am quite certain that merchants would be greatly imperilled if the provisions of this Act of Parliament were abrogated.

9. You think, therefore, that the prevailing impression throughout the City of London upon this subject is founded upon sufficient reasons, and it is confirmed by your professional observations and experience?
I am quite certain that is so.

10. You think that if verbal engagements entered into, either by the parties themselves, or on their behalf by intermediate brokers, were rendered valid by parol evidence, there would be great danger of parties being bound to contracts which they never intended to adopt, and that both ambiguity and litigation would arise, partly from misconception, and in some cases from a worse motive?
That would certainly be the case; the contracts in the City of London are exceedingly various and exceedingly complicated in their character. I speak more particularly of mercantile contracts: the terms of those contracts are exceedingly various; they comprise a very great amount of detail, and it would be quite unsafe for merchants themselves to contract without writing; and it would be still more unsafe, considering the course which prevails, of business being transacted through brokers, that these parties should be allowed to bind the merchant by contracts without writing.

11. You think that the business of the City of London that has come under your observation could not be safely conducted on the system of giving legal validity to mere verbal contracts?
I think it could not, certainly.

12. Have you examined the proposed Bill, and the Report of the Commission upon which it is founded?
I have.

13. Do you think that the provisions of this Bill in this particular respect are consistent with the principles laid down in many parts of the Report, with reference to the necessity of having written certainty attached to a variety of obligations?
It appears to me that the principle of the first clause in this Bill is altogether at variance with all that has hitherto been done upon the subject. The Statute of Frauds has not only been maintained, but by Lord Tenterden's Act of the year 1829 the provisions of that Act were extended, and were extended with universal approbation, and were extended to cases that were supposed to be omitted in the Act of Charles II. In particular, the Statute of Frauds, applying to contracts for goods, was considered not to extend to executory contracts, that is to say, for goods not in existence; so that if you bought a carriage, it required a contract in writing; if you ordered a carriage to be made, it was construed that the contract need not be in writing. Lord Tenterden's Act extended the Statute of Frauds so as to make it comprise those cases. Lord Tenterden's Act comprised also several other cases, in which his experience showed him that it was very desirable that matters hitherto done by word should be done by writing. For instance, in regard to the Statute of Limitations, by which debts not sued for within six years are barred, an acknowledgment of the debt within six years kept alive the liability of the debtor. The Courts of Law considered that that acknowledgment might be verbal; but Lord Tenterden's Act required that the acknowledgment should be in writing. Again, Lord Tenterden's Act required that any representations as to character or credit, by which parties were to be bound, should also be in writing. And the progress of legislation up to the present time has been, as far as I know, to increase the obligation of writing. So in the case of the Statute of Wills, in the same manner, up to the year 1837, wills of personal property did not require witnesses. An Act has passed requiring that those wills should have two witnesses. An Act passed in the year 1821, requiring that inland bills of exchange should always have the acceptances written upon them, which hitherto had not been necessary. It was held that a verbal acceptance was sufficient. This Bill itself, which is now before me, extends that provision to foreign bills, and requires that the acceptances shall be in writing upon the face of the bill. And, generally speaking, I should say that up to the present time the impression has been, that it is very desirable that obligations should

should be in writing. And, so far as I know, the present is the first instance of an attempt, to any very large extent, to relax that obligation, and it is certainly inconsistent with the course of legislation hitherto adopted.

14. You think, then, that the whole tone and principle of legislation recommended by Lord Tenterden was directly in the opposite direction to that which is recommended in the clause now under consideration?

I do.

15. You think that Lord Tenterden's views tended invariably to require on the part of parties who sought the aid of the law to enforce their obligations, greater distinctness and certainty in the form of those contracts, namely, by giving them a written character?

That was so; and that is the case also in this Bill. In this Bill, you find that it makes the Statute of Limitations of Actions more stringent than it was before; that is to say, it confines the right to sue to a period of six years, in cases in which it was not previously so confined. There are several clauses in this Act which tend in the same direction.

16. In the Report upon which this Bill is founded, in a section in page 12, which has reference to the subject of "Principal, debtor and surety," there is this passage, giving a recommendation in favour of maintaining a written form, and the reasons for it: "We prefer the rule that prevails in England and Ireland on this subject, for it is one on which oral communications may frequently lead to mistakes. A vendor of goods may very honestly suppose that a third person means to guarantee the payment of the debt, when the latter may just as honestly mean only to express an opinion as to the solvency of the buyer, and to stop short of becoming security for him." Is it not, in your opinion, equally possible that the same uncertainty, arising from verbal communications, may take place in making contracts for the sale or purchase of goods?

Most decidedly. I think that very much of the same uncertainty may arise as to the intention of the parties in the case of contracts for sale or purchase of goods. Considering the mode in which business is done in London, considering the mode in which the treaties go on by brokers, I think it exceedingly probable that transactions which were never contemplated as going beyond treaty by the one party, will be considered by the other party as matters of contract, and that most serious misunderstandings will arise in those cases.

17. Are not the transactions referred to in contracts between merchants, through brokers, more complicated, and therefore more likely to give rise to ambiguities and difficulties than the contracts alluded to in this Report, namely, between a principal and a debtor, and his surety?

They are very much more complicated.

18. The Report continues: "Such mistakes lead to litigation and a conflict of testimony much to be regretted; whereas the English and Irish rule is simple and easy of application, except in one particular, viz., the statement of the consideration for such guarantee,—a matter which has occasioned some litigation, and, we fear, some failure of justice in the English Courts." I presume you are of opinion that at least an equal degree of "litigation and conflict of testimony much to be regretted" will be incurred if the clause under consideration is adopted?

I am quite satisfied that if this clause is adopted there will be increased litigation for a considerable period, at all events in the Courts, consequent upon it. At present the fact of contract or no contract, at all events, depends upon a written document. From this time, if this Bill were to pass, that fact, and not only that fact, but all the details of the contract, would become a subject of controversy in the Courts of Law, depending upon memory, frequently after a very considerable interval of time: facts relating to particular classes of trade will be better spoken to by mercantile witnesses. But I may just mention, as an example, the Russia trade, in which contracts are made in the course of the summer, to be performed at the end of the year. The question of breach of contract in a case of that sort would not arise till the end of the year, and it would not come on for trial for some months afterwards, and then the question of fact, and all the details of that particular contract, would have to be discussed upon the memories of persons after an interval of very many months.

J. W. Freshfield, Esq.

21st May 1856.

19. You have alluded to the case of the acceptance of bills, and to the provision contained in this Act, requiring the acceptance invariably to be in writing. I will refer to a passage in the Report upon that subject, in page 14: "In England and Ireland, before the passing of the Statute 1 & 2 Geo. 4 c. 78, an acceptance by word only, or by detached writing, was held sufficient at all events in favour of a party to whom such acceptance was communicated, and who took the bill on the faith of it: from time to time eminent Judges expressed their opinion that it would have been better doctrine if it had been originally determined that nothing else should amount to an acceptance than a written acceptance on the bill itself." I presume that that same consideration would apply equally to contracts as to the acceptance of bills?

I think that with regard to this proposed alteration of the law (in which I quite concur), the great advantage is the removal of uncertainty, and the prevention of litigation; and those are precisely the points in respect of which this Bill operates in the very opposite direction in the first clause; for I think it will create uncertainty, and provoke litigation.

20. Earl *Grey*.] You say that the proposed alteration with regard to bills of exchange is right, in your opinion?

I do.

21. Lord *Overstone*.] I will refer again to the last passage in that paragraph: "The extent of the mercantile transactions which now take place between traders in the different parts of the United Kingdom renders it expedient that the same law should prevail in all parts of it; nor do we find sufficient reasons for adopting a different rule as to the acceptance of inland and foreign bills; and we recommend that the law on this subject shall be assimilated throughout the United Kingdom, and that no acceptance of a bill of exchange, whether inland or foreign, shall be sufficient to charge any person, unless such acceptance be in writing on such bill;" do you see any reason why, if an acceptance should not be sufficient to charge the person, unless it be in writing, a contract should be sufficient to charge a person, without being in writing?

I have already stated, that I think the reasons which require that the acceptance should be in writing, namely, certainty, and the prevention of litigation, apply more strongly in the case of the complicated contracts for goods which exist in London, as to which the fact and the terms are much more difficult to be ascertained, than the simple question of the acceptance or non-acceptance of a bill by parol.

22. I will now call your attention to a passage in page 78, with reference to mercantile guarantees, where some Scotch evidence is given upon the subject of the validity of oral or written engagements: "The leading distinction between the laws of England and Scotland, as to mercantile guarantee, appears to consist in writing being required in the former in all cases, whereas in the latter it may, in numerous classes of cases, be established by oral evidence. We entertain different opinions as to whether it is preferable that such guarantees should be constituted and proveable by oral evidence, or whether writing should be indispensable. In support of the former view, it is said that such guarantees are matters as to which witnesses do not readily mistake, and there is no absolute principle requiring writing;" I presume that contracts are matters respecting which witnesses would readily and constantly mistake?

I think they would constantly mistake.

23. "And particularly with reference to guarantees founded on representations as to the position of parties, it is said fairly and plainly that there is no reason why a person should not be held liable for a spoken as well as for a written misrepresentation or misstatement, all admitting that fraud infers liability. On the other hand, it is said that public policy is adverse to indiscriminate cautionary obligations, and that parties should be put on their guard, by interposing the formality of writing;" I presume that you think that parties should be equally put on their guard, by interposing the formality of writing, in the case of contracts?

I think so. The question which is here discussed, is one of the questions settled in England by Lord Tenterden's Act; namely, that representations as to the position of parties should not be held to constitute liability, unless they were

were made in writing. Lord Tenterden thought it necessary to extend the law, by requiring those to be reduced into writing.

24. "Farther, in construing what takes place verbally, there may be so little difference between merely giving an opinion as to the circumstances of a person, and a guarantee for him, that witnesses may be very apt to mistake the meaning or intention of parties, particularly in claims founded on representation;" are you of opinion that there is equal probability that witnesses may be very apt to mistake the meaning and intention of merchants in entering into conversation and discussion with each other respecting contemplated contracts?

I think so, in both respects; that is to say, first, as to the principal question, whether an actual contract is contemplated, or only a treaty. There is great liability to mistake; and the subsequent views of parties will be very much modified by the state of the markets, and other considerations on both sides. And further, as to the question of terms; that is also liable to be very much misunderstood and mistaken in conversation. I do not think that in settling the complicated contracts arising in mercantile transactions in London, it is possible for the parties to settle those terms verbally. I think it is not till they see them reduced into writing that they can fairly understand what is meant by themselves, very frequently.

25. The following opinion is given by Mr. Blair, who is the manager of the Bank of Scotland (page 79): "I am of opinion that a guarantee should be written, and not be open to proof by parol evidence, or by oath. It seems to me, that the latter description of evidence should be admitted only in cases perfectly simple and well defined, and in which the terms cannot be easily mistaken;" do you think that the ordinary transactions between merchants can be so described as cases "perfectly simple and well-defined, and in which the terms cannot be easily mistaken"?

Certainly not; of course there are contracts in respect of goods of a very simple character; but I am speaking now of mercantile transactions in the City of London, to which I have previously adverted.

26. You are speaking of a large majority of those transactions which must necessarily be affected by the proposed alteration of the law?

I am.

27. You think, upon the grounds here adverted to, that there would be great danger of misapprehension, and that injury and injustice to merchants would arise?

I do.

28. Lord *Stanley* of Alderley.] Would your observations apply equally to those cases of simple contract which you have stated are not subject to the same considerations?

I think in many cases of mere sales of goods there is not the same risk of mistake or misapprehension. Your Lordship knows that you make purchases in a shop of goods to a value exceeding 10*l.* without a written contract, and without any risk of mistake or misapprehension; the same thing is done in the City of London in other transactions to a considerable extent, and with very small risk of misapprehension; but I do not think that that principle can ever be extended to the mercantile dealings of the City of London.

29. Then, I understand you to say, that there are a very large number of transactions consisting of simple contracts of sale and purchase which need not be subject to written contract, but which might be easily and satisfactorily conducted by verbal contracts?

No, I did not say that I thought those transactions could safely be conducted without written contracts; I think they ought to be conducted under written contracts, but I do not think that there is the same complication and the same risk of mistake that is referred to in the paragraphs which have been read.

30. Lord *Overstone.*] I understand you to say, that your view is, that there are many contracts of a minor and subordinate character, as to value and other considerations, which may easily be conducted verbally; but that if parties are not content to rest with the security which honour and custom and character give to those contracts, and wish to have the aid of the law in enforcing them,

J. W. Freshfield, Esq.

21st May 1856.

they ought to give their best assistance to render that law safely and certainly applicable, by reducing those contracts to writing?

That is my opinion; I think those contracts are very numerously made, and may very safely be made in the present state of the law. In the present state of the law parties are not legally bound by verbal contracts; and we all know that honorary contracts are frequently better performed than legal contracts; but I think if you withdrew the protection of the Statute of Frauds from those contracts, and left those contracts to be subject to be enforced upon mere verbal engagements, they would be the subject of misunderstanding and litigation to a fearful extent; I am speaking of those contracts of a more simple character which are now carried on without writing.

31. Is it, in your opinion, a reasonable and sound principle, that if parties wish to avail themselves of the aid of the law to enforce their mutual obligations, they are bound to assist the law in its efficiency by making their obligations as distinct as it is in their power to make them?

I think those parties will always, for their own interests, take the contracts in such form as they find to be necessary for their own security; they have at present the means and opportunity of taking them in a legal form, if they think fit; if they think they can dispense with that, the law in no degree restrains them from so doing, although it does not assist them in that case.

32. Lord *Stanley* of Alderley.] Would not it be a great inconvenience in the transaction of business if you were to require in all cases written contracts?

I do not think it would be; I think it would be very much objected to by a great many persons who do not choose to take the trouble to do it, but I do not think that it would be any serious impediment to the conduct of business.

33. *Lord Privy Seal.*] Did not you say that there is a large class of transactions which you consider are better conducted by honorary contracts than by legal ones?

I think there are a large number of transactions that are better performed upon an honorary contract than upon one in a legal form. I do not say that they are better conducted, but that a contract of an honorary character is frequently better performed than a contract of a legal character.

34. With regard to those contracts, the only effect of the present law is this, that if the party contracting wishes to escape from his obligation, he has now, by the Statute of Frauds, the power of disowning it?

He has.

35. Is not the operation of the Statute of Frauds this, if it is universal it is perfectly good and satisfactory, but the moment it ceases to be universal it gives an opportunity of committing fraud to persons concerned in transactions which either habitually or for convenience are carried on by verbal contract?

I do not think that is exactly the effect of the Statute of Frauds. Under the Statute of Frauds a man is not bound by his contract, unless it is in writing; if he makes a verbal contract, and does not perform it, he has the power, of course, of escaping from it in that particular instance; then he would either not be trusted again, or he would be required to contract in writing; the difficulty would not occur a second time; but if you abolished the Statute of Frauds, the difficulty, I anticipate, would occur every time, and it would be impossible for parties contracting to relieve themselves from those difficulties.

36. Why should not a person give a distinct instruction to his agent to enter into no contract except in writing?

The business of London is not conducted through agents in that way; the brokers are more properly middlemen than agents; they go from counting-house to counting-house; they learn that a merchant has a cargo to sell, and they apply and enter into conversation and treaty with those likely to buy without any direct employment by them, and when the terms are settled, they are, by the custom and law of London, agents to make a contract, and to sign a contract; but the merchant would practically have no power of restraining them by previous instructions, from entering into unwritten contracts as if they were his own individual agents.

37. You mean that he has no power of protecting himself, except by the Statute of Frauds, from an obligation incurred by those parties on his behalf?

I think

I think he would have no adequate power of protecting himself from having those contracts thrust upon him. *J. W. Freshfield, Esq.*

38. Lord *Overstone.*] Even upon the supposition put, if a merchant gave notice to this supposed agent that he would not be bound by anything but a written contract, how could a knowledge of that notice be insured on the other party? 21st May 1856.

A merchant would not be bound if he had given distinct notice to his agent not to bind him, because he would be then a person acting without authority.

39. But even supposing the merchant to be protected, does it not leave the other party still open to fraud?

The other party might be deceived or defrauded; but you have to look at the general nature of the business in the City of London, and to consider the case of a merchant meeting another merchant upon Change: according to the view proposed, the merchant must, in the first instance, say, "Recollect, I contract only in writing;" because if he entered into a treaty without first saying that, the other might go away under the impression that it was a contract, while he himself had the impression that it was only a treaty.

40. What evidence would there be of his having given such notice?

It would depend upon verbal evidence; a dozen brokers come into a merchant's counting-house in the course of a day; it is impossible for him to say to every one of them, "Recollect, I contract only in writing." Then, if he enters into discussion, from that moment the man is subject to the risk from which the Statute of Frauds was intended to protect him, namely, the risk of a fraudulent attempt to put a contract upon him, and the still greater risk of misunderstanding arising from the strong desire of the other party to enter into a contract with the merchant, while he considers himself as only treating.

41. Earl *Grey.*] The broker's object of course is to make as many contracts as possible?

The broker's object is to buy or sell, and the merchant to whom he comes may or may not have made up his mind; he may or may not be treating; he may be treating with a third party; he may have half a dozen applications from as many brokers in the same morning who know that he has a cargo of sugar to sell, and he may find, in the course of the day, that the whole half dozen think that they have bought it of him.

42. *Chairman.*] You are of course aware that a broker cannot enter into a contract to bind the principal unless he has been authorized to do so?

No.

43. The authority to do it need not be in writing now?

No.

44. Then is not the present practice open to just the same objection, namely, that the broker may enter into a written contract to buy or sell, supposing that he is authorized to do so, when he really is not so authorized?

No; because the broker sends his bought and sold notes to the parties, who are at liberty to reject them within a certain time; that is the usage, and the broker's authority is subject to that restriction. His power to enter into a contract is subject to its being submitted to the parties.

45. Earl *Grey.*] Does the law, as it stands, recognize the power of the merchant to reject a contract made by a broker within a certain time?

That question has never been contested.

46. *Chairman.*] What would be the difficulty in the merchant saying to the broker: "I agree to such a purchase," or, "such a sale, but give me a note of it"?

What I am contemplating is a case where, for example, the broker does not send any note of sale; but, two months afterwards, there is a question of a contract alleged to have been made two months before. The merchant says, "I made no contract at all;" "Yes," says the other party, "you did; my broker called on such a day, and bought goods of you." That is the class of misunderstanding which I apprehend.

J. W. Freshfield, Esq.

21st May 1856.

47. Lord *Stanley* of Alderley.] Might not any merchant wishing to enter into a transaction, and to protect himself by the support and sanction of a written document, instruct his broker not to enter into any contract for which he had not received a written authority?

If the broker was the agent of the particular merchant, of course he would give instructions to his agent to enter into no contract except in writing; but the broker is a man more in the character of a middleman than of an agent; he is a man who acts intermediately for both parties; he receives instructions from one to buy, and then he goes to another to see whether he can sell, and therefore the merchant has not the choice of his own broker or agent in those transactions; but a third person comes to him, and that third person enters into a treaty, and with that third person he is supposed to contract; therefore, unless when a man enters into his counting-house, he at once says, "Be so good as to understand that nothing that I say here shall bind me, unless it is in writing," he would be fixed with a contract.

48. Lord *Overstone.*] Suppose this case: there is A., a party having goods to sell, B. wishing to buy such goods, and X., an habitual broker, but not distinctly employed as a recognized agent of either party, intervenes; X. holds communication with A., and he holds communication with B.; two months after that, X. comes to A. to demand the fulfilment of a contract of sale which he had made in the name of A. to B.; A. replies, "No such contract was made by me; I told you, when you came to me, that I would not be bound by any contracts that were not reduced to writing, and you did not give me any contract in writing;" X. says, "I totally deny that statement; I swear that you gave me verbal authority, without such notice, to make such a contract, and I call upon you to fulfil it." What would be the position of A. in that case?

It would become a mere question of oath against oath.

49. Is it expedient that such a contingency as that should be allowed to occur; is not the danger of such a contingency as that a real and practical one; and is not the requiring a written contract, as a necessary condition to enforce its fulfilment legally, an effectual guard against such a danger?

I think it most dangerous to allow such questions to arise.

50. Is it not reasonable and just that merchants should ask for this protection when they have enjoyed it for a long period of time, and that they should vigorously resist any proposition to deprive them of it?

I think so.

51. Lord *Stanley* of Alderley.] You are aware that this practice does not prevail at Manchester, and in other parts of the country; have you heard that any inconvenience has resulted from it at Manchester, or in Scotland?

I have been told that in Manchester the course is to buy and sell on Change; they buy a particular and well-known article to be delivered at a certain price. Each takes a note, and makes an entry in his book; then an invoice or bill of parcels is sent in, and that contract is performed; that contract is perfectly well understood among themselves to be an honorary contract; it is one upon which there can hardly be a mistake or misunderstanding. If a question arises, being an honorary contract, it is necessarily referred to some third party, and as it occurs in a limited community between a class of persons who know one another perfectly well, I have no doubt that very small inconvenience does arise from that practice. Very few misunderstandings take place, and those, when they do take place, are honourably removed; but I feel satisfied that that course and practice of dealing could not be extended to London, where the community is larger, where the dealings and the articles dealt in are much more varied, and where the terms of the contracts are very much more complicated.

52. Earl *Grey.*] Is it not possible that the safety of the system in Manchester may arise from the very fact that the engagements are only honorary, and cannot be enforced in a court of law?

Decidedly, I think so. No doubt occasionally it will arise that some man repudiates his engagement; no doubt that will arise, and complaints of losses will take place, as always must take place in any course of dealing, because we are not to legislate for a state of things which will ensure perfection. But I maintain, that in the present state of things you have a much smaller amount

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of injustice, and a much smaller amount of injury, and much greater protection against fraud and perjury, than would be the case if any other system were adopted.

53. While those engagements are only binding in honour, no man will attempt to set up an engagement which has not really been made, because he knows that the person against whom the claim was made would at once repudiate it; but if they were capable of being enforced in a court of law, would there not be a temptation to dishonest persons to set up a claim for a bargain that was never made, and to bring the other party into a court of law?

I think there would.

54. So that this system of doing business really depends, for its safety, upon its resting upon honour, and not upon law?

That is my decided opinion; I think a very large extent of dealing may continue to exist without contracts in writing. Under the existing law, the injury arising will be very small; whereas under the other course I think the danger would be very large and of very frequent occurrence, and the risk of litigation would be enormous, I think.

55. We have been talking hitherto chiefly of *bonâ fide* misapprehension between parties; but is it not possible that there may be designing and unprincipled men who may attempt to impose a disadvantageous bargain upon merchants, by bringing forward false evidence as to conversations, if this system were to be adopted?

I think it possible; but I think that the risk of misapprehension and misunderstanding is, after all, the great risk. I consider that fraud is possible and probable under such a system; but the great risk to apprehend is that of misunderstanding. The strong bias of every man to look at his own interest, and to look at a contract in that point of view which is most favourable to that interest, will always lead a man, even honestly, to take a different view of a question of a complicated contract from that which the other party will take.

56. I understood you to say, that a merchant in the City of London communicates in the course of the year with so great a number of different brokers, that it is practically impossible for him to protect himself by any general declaration; he would only be bound by a written contract?

I think so.

57. Lord *Stanley* of Alderley.] In the observations as applied to Manchester, you state that no inconvenience results from that fact: will you also be good enough to state whether, as far as your experience goes or your information leads you, any inconvenience has resulted from the existence of the law as now in Scotland where these transactions are legal, and where it may be proved by evidence in writing?

I know nothing of the law of Scotland.

58. Lord *Overstone.*] Manchester is an inland town, and London is a port?

Yes.

59. Is it not obvious that the nature of the transactions of merchants carrying on a large business at a port must be very different from the nature of the transactions carried on by inland traders in an inland town?

The nature of the dealings in London is of a character and of an extent quite different from those of an inland town, or of any other port in the United Kingdom; Liverpool is the only one approaching it, but that does not, substantially speaking, approach it. London is the emporium of Europe almost, and a very large proportion of the transactions of the Continent centre in London. There is one class of business which I may advert to, namely, the transactions in floating cargoes. Almost all the produce of Brazil and Cuba, and very large quantities from other parts, come to England in ships chartered to bring them to Cowes, or some other port in the Channel, there to wait for orders to carry them on to some further port on the Continent, to which they will receive instructions to carry them. The consigners of those cargoes of goods send instructions to a London merchant to sell those cargoes, and as soon as the London merchant gets instructions he sends for a broker: the samples are frequently sent on by steamers.

J. W. Freshfield, Esq.

21st May 1856.

He gives the broker instructions to sell entire cargoes of this description, and as soon as the ship arrives, the purchaser gives orders to the captain to take the cargo and deliver it to Antwerp, to Hamburgh, to Bremen, to St. Petersburg, or wherever it may be. Those transactions are very large and numerous; and of course they are exceedingly complicated in their character. All the details of those contracts require great care, and great minuteness, and accuracy of expression; and transactions of that kind of course are unknown in any other port except London.

60. *Lord Privy Seal.*] Would not a practice in the trade very soon grow up which would govern the transactions in question, as in the case of other articles of commerce; would it not be soon understood, that in transactions of this nature, anybody who brought a charge against a merchant of having entered into an arrangement of this kind upon a parol contract would find very slight credence?

I think that quite possible.

61. Would not a mercantile custom very soon arise, having the force of law, in a case in which such paper transactions are strictly equitable?

I think it quite possible that every trade might conform itself to the law eventually; but in the meantime, there would be very great injury and very great evil, and I do not think that any custom could give us anything like the same protection that the Statute of Frauds gives.

62. Is it not a great evil that there should be a certain class of transactions that are carried on without the protection of the law, and that such transactions should be exposed, to be abandoned by fraud at any moment?

In my experience that evil is but very small.

63. Your experience is, that the evil arising from a large amount of transactions being carried on without the protection of the law is very small?

Yes; I think the evil is very small.

64. *Chairman.*] This case was put just now: A. having goods to sell, and B. wishing to purchase similar goods, the sale and purchase takes place through the intervention of X., the broker; and the suggestion is, that two months after the transaction, a fictitious contract might be palmed off either by A. upon B., or by B. upon A.; what is there to prevent that being done now?

The broker sends a note of the contract immediately it is made.

65. Not under the Statute of Frauds?

No.

66. There is the usage, and there might be the usage under any system; but what is there to prevent an unauthorized note just as well as an unauthorized parol contract?

At present the broker has no written or special authority to make the contract. His authority is to make the contract according to the custom of the trade, and that custom requires that he shall submit the note to his principal, who is at liberty to return it within a given time; that is the only authority that he has.

67. *Lord Privy Seal.*] Would not that protect him against a contract two months old?

By the proposed alteration of the law, you are taking away the written contract altogether.

68. There is nothing to prevent this note being still required by the custom of the trade?

While you say that the contract shall be in writing, you ensure the note; but if you do away with the necessity of that, the broker may say, "In point of fact, you did contract with me verbally." Suppose the broker's note is sent in, not in conformity with the intentions of the parties, and a question arises upon it; the matter is recent, it occurred yesterday, and it is set right without any substantial loss upon either side.

69. That note depends, not upon the Statute of Frauds, but upon the custom?

A written contract is required by the Statute of Frauds, and that note is a written contract in conformity with the statute.

70. Earl

70. Earl *Grey.*] Till that written note has been accepted, there is, under the Statute of Frauds, no contract?
No.

71. *Chairman.*] What is to prevent that being done still?
The party sees it the next morning.

72. There is now an authority given impliedly to a broker to enter into a contract, by which he says, I agree to be bound if you send it to me to-night or to-morrow morning, or any other time, and I then accept it. That is all by the usage of the trade of London; why should not that continue?
If you do away with the Statute of Frauds, the broker is under no obligation to send any note.

73. Lord *Stanley* of Alderley.] He is not now under obligation, but it is the usage and practice; why should it not continue to be the usage and practice?
I consider that he is under obligation now to do it by the Statute of Frauds. I consider the broker, at the present moment, is an agent with a limited authority; that is to say, an authority to make a contract subject to approval.

74. Lord *Overstone.*] If I understand the case correctly, it stands thus: under the present state of the law, no broker can establish a contract against a merchant unless he can show something in writing having reference to that contract?
That is so.

75. Under the Bill, a broker would be able to establish a contract against a merchant, although he might admit that there was nothing whatever in writing?
Certainly; that is so.

76. And it is the danger, both of misconception and injustice arising from misconception, and possible fraud, from the fact of the broker being able to establish a contract against the merchant without a written memorandum to confirm his statement, from which you anticipate so much mischief?
Yes.

77. *Chairman.*] Do you consider the Statute of Frauds to have reference to the protection of the broker against his own principal, or the principal against the broker; is not the Statute of Frauds to protect the buyer against the seller, or the seller against the buyer?
Yes.

78. Earl *Grey.*] A broker's note duly signed is considered, under the Statute of Frauds, a binding engagement?
It is.

79. And the injury which you anticipate from the first clause of this Bill as it stands, is, that by superseding the necessity of having such a signed instrument, you throw the transaction entirely open to parol evidence?
Exactly so. The Statute of Frauds requires that there should be a contract signed by the party to be charged therewith, or his agent thereunto authorized. Of course if the contract is signed by the party, there is an end of it; if it is signed by the broker, then the question is, what is the authority of the broker? And we certainly conceive (because there is nothing in the statute prescribing the form of a broker's bought and sold note), although it has never been decided, that the broker's authority is to enter into a contract subject to the right of the principal to repudiate it if not in conformity with the terms. It necessarily comes to an issue within a very few hours, and if the question arises, the probability is, that it is disposed of by the recollection of the parties, and if it is not disposed of by the recollection of the parties, the damage done is small; but if this is postponed for months, the markets may have affected the question very seriously. Then the dealings of this class are so large that on one contract the loss from a rise or fall of the market may be a fortune almost; whereas those transactions that are carried on without contracts in writing, although very numerous, are small in amount, separately for the most part.

J. W. Freshfield, Esq.

21st May 1856.

80. Lord *Stanley* of Alderley.] Is a broker's note considered in the Courts of Law as a written instrument of the nature of a contract?

It is; the two parts of the broker's note constitute a written contract.

81. Earl *Grey*.] Will you explain precisely the manner in which the broker's note is given; he furnishes a note to each of the parties, to the seller and to the buyer, each signs himself, and the two parties take this note, and the same man is agent in each case?

I will take the case of those floating cargoes. The merchant receives advice that two or three cargoes of sugar are coming to him, which he wishes to sell; he sends for a broker, and he says, I have such and such cargoes coming on; that same man goes into the counting-houses of half a dozen different persons whom he thinks likely to be disposed to buy. He is not the agent of the buyers, excepting as a public broker; but he enters into a treaty with each severally as to terms, and when he considers that he has come to a conclusion that he has sold the cargoes, he draws a contract, stating the terms between buyer and seller, and that contract is entered by him in his book, and signed by him; and at one time it was thought that that contract so signed by him in his book bound the parties. But, besides that, he sends to each party a note of that contract: he sends to the seller a note, stating, "I have sold for your account to So-and so;" and he sends to the buyer a note, stating that he has bought for his account so-and-so. Those two notes state all the terms of the contract just as they are stated in the broker's book; and the law is now understood to be that those two notes of the broker together constitute a contract under the Statute of Frauds.

82. Lord *Stanley* of Alderley.] They are only a provisional contract, subject to the acceptance of the parties, and if not accepted within a certain time, they become void?

Yes; the parties may return them within a limited time.

83. *Chairman*.] Put the case of A. the seller, and B. the buyer, when the broker makes out the bought and sold notes, which note does he deliver to A. the seller?

He delivers to him the sold note.

84. Not the note from the seller signed, as his agent, to the buyer?

Yes; "Sold for your account to So-and-so."

85. The sold note is delivered to the seller?

Yes.

86. And the bought note to the buyer?

Yes.

87. So that it is not that the contracting parties have each a paper signed by the party with whom they are contracting, or his agent, but they have a memorandum from their own agent of what he has done for them?

No, that is not so; because the note specifies all the terms; and all that is required by the statute is, that it should be signed by the agent of the party to be charged therewith; and, therefore, when he delivers to A. the note, that note is signed by him as the agent for B., and when he delivers the note to B., that note is signed by him as the agent for A.

88. What is delivered to A. is not a note signed with this meaning: I, B., undertake to purchase from you so-and-so; but it is I, as the agent of you, A., have sold to B.?

I think the construction must be so, because otherwise it would be no contract by the Statute of Frauds, and the Courts have held that the note is a contract by the Statute of Frauds.

89. They have stretched a point, in order to get the usage of the City of London, to bring it within the Statute of Frauds?

No doubt.

90. Lord *Stanley* of Alderley.] The broker is the agent of both parties?

Yes.

91. *Chairman*.] Does not your experience lead you to know perfectly well that it has been always the opinion that these bought and sold notes were not really contemplated by the Statute of Frauds, but what was contemplated by the

J. W. Freshfield, Esq.

21st May 1856.

the Statute of Frauds was a written contract, I agree to sell delivered over to the buyer, or *vice versâ*; that is never done, but the common agent of both signs a note telling his principal, on each side, what he has done for him?

No doubt the law has endeavoured to conform itself to the course of trade; but then the principle of the law necessarily remains, that there should be a written contract.

92. Earl *Grey*.] And the law, by prescribing no particular form of written contract, has enabled this form practically to be established as legally binding?

Certainly.

93. Lord *Stanley* of Alderley.] Is it not the fact that the law has admitted, for the sake of convenience, other evidence than that of a written contract?

No, it is not; the question is decided upon the written contract.

94. Lord *Overstone*.] Does not the growth of this practice clearly show the universal feeling of the expediency and desirability of something written being interposed in the contract?

I think so, decidedly.

95. And the merchants and traders of London have adopted this system of notes, under the impression that it is expedient for their interests and security that something written should always exist, and they have found practically that this course does give them the protection which they desire?

You must consider that this practice has been forced upon the merchants and traders of London by the Statute of Frauds; but no doubt it is used largely by merchants, from the conviction that it is necessary to their interests.

96. They would not have adopted this system if they had not felt the necessity for their safety and their interest of having something written as a mode of referring to what is really understood and meant in these transactions?

They cannot dispense with a written contract. They might deal upon honour as many of the traders do, but they cannot dispense with a written contract.

97. Lord *Stanley* of Alderley.] Does not this show that, for the sake of convenience, they have substituted something in the place of a direct and immediate written contract between the buyer and the seller?

I think not; my own impression is, that this is a written contract between the buyer and the seller; it is in writing. It states all the terms, and is signed by a person who is recognized to be the agent of both.

98. Earl *Grey*.] And it has been held by the Courts of Law that that does constitute a contract?

Yes; and those contracts are upheld upon the ground that it is a dealing in conformity with the Statute of Frauds.

99. *Chairman*.] Is not this the case, that there is a common agent of the buyer and the seller, and the agent states in writing to the buyer what he has done for him, and to the seller what he has done for him; and, assuming the two to be identical, which they will be, it has been held by the Courts to be a signing by the party to be charged upon one side and upon the other?

Yes. I recollect that it was considered that the contract in the broker's book was the true contract, binding the parties, because there not only all the terms were stated, but the names of both buyer and seller were put together, and it was supposed the broker signed as agent of both; but afterwards the Courts gave effect to the broker's notes, rather than to the contract in the broker's book.

100. Is it not your experience, that the existence of the statute does very often give rise to litigation and very discreditable consequences?

Litigation, no doubt, frequently arises; but I think litigation is not occasioned by the statute in anything like the proportion in which it would be occasioned by the want of the statute. The first question is the constat of a contract, and the statute says that it shall be in writing; you have now much litigation upon those cases which are excepted out of the statute; but upon those cases within the statute, there is no litigation at present. Questions will arise on the terms of a contract in either case.

101. Does this often occur, that there is a written contract to sell goods, the price to be payable upon the 21st of May: the parties meet afterwards, and the

J. W. Freshfield, Esq.

21st May 1856.

seller, at the instance of the buyer, says, I will agree that you shall pay upon the 28th of May instead. The 28th of May comes. The buyer says, I have nothing to do with it. You have absolved me from the first contract, and the second contract was not in writing?

If a contract is in writing, I apprehend it is binding.

102. Suppose the contract was to pay upon a certain day, and afterwards time is given at the instance of the buyer, verbally; what would be the result?

I never met with that case. I have heard of cases where the buyers and sellers' notes have varied, where the time has been inserted differently in the one and in the other; and, no doubt, those contracts, under the Statute of Frauds, are void, because the contract entered into with the one being different from the contract entered into with the other, there is no common contract.

103. Was not there a case where a seller agreed to sell a cargo of Scotch iron, and the purchasers said that it was Dunlop's iron, and the parties were absolved from the contract because it was not the same?

That may be so; but if a broker, having the terms of a contract before him, makes a variance when he comes to make out the two notes, having nothing to do but to copy, only consider what will be the variance between the parties when all that is left to verbal understanding.

104. What is to be the necessity that it should be left to verbal understanding—why may not the principal always insist upon the contracts being reduced to writing?

If that is the case, that is, if written contracts are to be continued, I do not see any reason why the law would not be exactly the same in that case of Dunlop's iron and Scotch iron after the statute is repealed as now. Suppose the Statute of Frauds did not exist, and it was only a written contract, entered into for convenience, that contract must bind the parties, without reference to parol; that being so, suppose it turned out that the contract was in two parts (a bought and sold note), and they differed, it would be quite certain the law must hold that there was no contract, just as it does now.

105. Lord *Stanley* of Alderley.] It would admit of evidence?

No, I think not.

106. Earl *Grey*.] You think that there is no inconvenience whatever from the law as it exists, and that there might be inconvenience in the change?

There is an inconvenience from the law as it exists; but the inconvenience occasioned by the law as it exists is small as compared with the inconvenience which would arise in case of a change.

107. *Chairman*.] Has it not been the practice in the Courts, in order to get out of the operation of the statute, that a printed invoice, with the seller's name printed at the head of it, has been taken to be a signing within the Statute of Frauds?

Yes, that is so.

108. Does not that seem to indicate that the Courts have struggled contrary to the common sense of mankind to get out of the enactments of the statute?

When your Lordship, as Lord Chancellor, has a case of hardship before you, you endeavour to do substantial justice; and that will always be the mind of the Judges, a strong desire to do substantial justice in a case of hardship or injustice, to struggle to escape from the strict obligation of the law.

109. The Courts feel that substantial justice cannot be done unless they struggle against the law?

No doubt; and I admit freely that when a man has made a verbal contract, and refuses to perform it, every right-minded man would endeavour to compel him to perform it, and therefore the Judges would say that it was a case of hardship, and they must endeavour to relieve him if possible; but you must look at the other side of the question, and see the substantial mischief that would be done if you relaxed the rule.

110. *Lord Privy Seal*.] Are the major part of the transactions now under the Statute of Frauds, or without the Statute of Frauds?

All the large transactions in London are in conformity with the Statute of Frauds;

Frauds; all that you may call the mercantile dealings of London are in conformity with the Statute of Frauds. The wholesale traders in supplying the retail traders to a very large extent dispense with contracts in writing; they send their travellers and take orders, and supply upon those orders without taking any written contracts. In Manchester I understand this is done, namely, parties meet on Change and enter their transactions in their minute books; the transactions are in a few articles, and those articles are very well known, and the risk of mistake is not large; and they are between persons of a station in life who very easily settle those mistakes. In Liverpool, substantially speaking, there are contracts.

111. *Chairman.*] How are the contracts for the sale and purchase of stock conducted in the City of London?

In point of fact, contracts are always made, although we consider they are not required by the statute; but your Lordship knows that that is an illustration of what may be done in a limited community. The stock-brokers are a community self-governed, and every member is held responsible for the performance of all the contracts entered into by him, and there is an obligation upon him much stronger than any Court of Law could enforce, because he is turned out of the room if he violates a contract. A very large majority of the contracts made upon the Stock Exchange are absolutely illegal, and yet they are performed to the letter; and it is only an illustration that an honorary contract is frequently a more binding contract than a legal one.

112. You are aware that stock shares, or railway shares, or canal shares, or any of those matters, are not within the operation of the statute at all?

They are not.

113. And yet the contracts are almost invariably in writing?

Yes, they are; and the brokers are under laws of their own; they have made a law for themselves; and if you could extend that law to the brokers of London, you might be enabled to dispense with the Statute of Frauds; but London is too large for that; the classes of persons carrying on trade are too various.

114. Lord *Stanley* of Alderley.] Are the brokers a very numerous class?

Yes; and there are brokers in different branches of trade.

115. *Lord Privy Seal.*] Would not they, if they had made a false representation with regard to a contract, lose caste?

I cannot say much about that.

116. Is not it the fact that a very large proportion of the mercantile transactions of this country are carried on without the protection of the Statute of Frauds, and are purely honorary; and is it not a very strong evidence that the encumbrance of the Statute of Frauds is very much felt, that people rather prefer to carry on their transactions at all risk of their being forfeited, than to gain the security that a compliance with the Statute of Frauds would give them, with all the inconvenience arising from the necessity of a written contract in each case?

I think not; if the Statute of Frauds were done away with, I think you would have more written contracts than you have now.

117. If so, what would be the evil; would not the custom apply so strongly in those cases where a written contract was notoriously requisite for the parties that it would put an end to all doubts in each particular case?

I feel satisfied that the merchants of London would struggle against any such law, and they would eventually conduct their business in a manner that was as nearly safe as possible; but I think you would subject them to an unnecessary and very serious risk by an alteration of the law in that respect.

118. Would not a party coming forward and pleading a parol engagement in one of a class of cases which are notoriously only carried on by the custom of the City of London upon written contracts have a very small chance of credence before a jury in the City of London?

I think he would be looked at with considerable suspicion; but at the same time it is not a pleasant situation for a merchant to be placed in to have an action brought against him upon a contract which a broker and another party are prepared to swear that he made verbally.

J. W. Freshfield, Esq.

21st May 1856.

119. Would not the evidence of the custom be a very strong support to him? Yes, I think so.

120. Would it not have the advantage, that a written contract would only become a legal necessity where it is what may be called a moral necessity, and would not be extended over a great class of transactions to which it does not apply, and where it is practically neglected?

In those cases in which it is practically neglected I think the evil of the want of it is small, and is capable of being corrected if required.

121. Lord *Overstone.*] In your judgment, the value of these contracts consists in many cases in their being a protection against honest misunderstanding and ambiguities, and in other cases against fraudulent misrepresentations?

Decidedly.

122. Consequently many objections may be urged which are applicable to fraudulent misrepresentations, but which are wholly inapplicable to cases of honest misunderstanding and ambiguities?

Yes.

123. *Lord Privy Seal.*] Might it not very easily arise that such contracts are not considered as binding upon the parties unless they are submitted to their approbation within a certain time?

I think so; and I think, in the course of years, the merchants would endeavour to adapt themselves to your Lordships' laws.

124. Would not the practice be to say, I only deal as I dealt before; I always insist upon it; and what case would be listened to before a jury of the City of London where this practice was neglected?

I should be very sorry to subject a client to a trial before a jury upon a question of that description, but I have no doubt that the practice would eventually conform itself to any law which your Lordships choose to adopt; but, at the same time, I do not think it possible that the merchants can, by any general measure, give notice that they will not be bound by parol contracts, so that they will always be at the mercy of a hard swearer, who comes in and says, "I made a contract with this man." It is quite impossible that a man should, the moment that a broker comes into his room, say, "Recollect, I deal only by written contracts."

125. He does not say "Recollect, I only consider myself bound unless you give me a note in 24 hours;" but the custom of the place binds him in that case; why should not the custom of the place bind him in similar transactions?

I think it is part of the law.

126. It is not under the Statute of Frauds?

The Statute of Frauds has no special reference to a broker; the Statute of Frauds requires that the contract should be signed by the party or his authorized agent. The question has always been, what is the authority of the broker; and my own impression, and the impression in the City certainly is, that a broker has only an authority to make a contract subject to revision.

127. Lord *Stanley* of Alderley.] Can you inform the Committee whether it is the practice of the silk trade, generally, to conduct its business without the intervention of written contracts?

I believe they have written contracts, but they are very loose and irregular, and sometimes not in conformity with the Statute of Frauds; that has arisen in consequence of there being only one or two brokers in the trade; and from their great influence they insure the performance of the contracts. I have known two or three cases of contracts in the silk trade not in conformity with the Statute of Frauds, and the explanation has always been that which I have stated.

128. Have you known any cases of contracts for sale being made with a silk-broker, and their being repudiated the next day, and in consequence of their not being written contracts they could not be enforced?

Yes; I was consulted in a case of that sort, and I was informed that the reason was that the brokers were all-powerful, and conducted the trade upon their own responsibility, to a great extent.

THOMAS MATTHIAS WEGUELIN, Esquire, is examined as follows:

T. M. Weguelin, Esq.

21st May 1856.

129. Lord *Overstone.*] YOU are the senior partner in the firm of Messrs. Thomson, Bonnar and Company?
I am.

130. And also the Governor of the Bank of England?
Yes.

131. In your capacity of merchant you carry on large transactions, principally with Russia?
I do.

132. And you are also a general merchant, trading with other parts of the Continent?
Yes.

133. Your transactions are carried on to a large extent, and your experience has been of long duration?
Yes, about 20 years in the City of London.

134. I believe the course of your business is to sell Russian produce shipped to this country?
Yes.

135. Such as tallow, hides, and other articles of a similar description?
Precisely so.

136. The course of your business is something of this nature, that you make sales of cargoes of Russian produce which is hereafter to arrive in this country?
That is one class of business.

137. In making those sales, there must necessarily be a great number of particulars regarding both the quantity and the quality of the article, the time of its shipment, the time of its arrival in this country, and various other points which must necessarily be included in the contracts?
The conditions of the contracts are very varied and complicated.

138. Do you think that those conditions could be safely entrusted to verbal communications?
They might be concluded verbally, but it would be impossible to retain them in the memory.

139. Are written contracts necessary in order to ensure a mutual understanding between the contracting parties certainly that they are agreed upon the terms?
Assuredly so.

140. In making those sales, are they usually made through the intervention of brokers?
Almost always.

141. Do you think that you could safely and satisfactorily, to yourself, carry on that business through the intervention of brokers, if you had not for your own security, and to give you certainty as to the character and nature of the understanding, something in writing exhibiting those complicated details?
I think it perfectly impossible that we could be assured that the other party to the contract was agreed upon the conditions, unless we had something in writing.

142. Have you any means of enabling the Committee fully to understand the nature and character of those contracts, and the various conditions which they contain?
I have selected from two articles various contracts which are very usual; they are in the form of brokers' notes; here are six, containing various stipulations for the sale of tallow.

143. Will you read the one that you think most illustrative of the case?

T. M. Weguelin, Esq.

21st May 1856.

Here is a contract for a sale free on board; this is sold for Thomson, Bonnar and Company, to probably our principals, or to the broker's principals: "200 casks of first sort of yellow candle tallow"—which is a particular description of tallow—"new, and of this year's break, at so-and-so pounds per ton, and 63 pods net, free on board ship, at Cronstadt, to be shipped on or before the 31st of July next, and to be paid for by the draft of the seller, St. Petersburgh-house, on the buyers, at three months from the date, and on handing the bills of lading; in case of any dispute about the quality, it is to be settled by arbitration, in the usual manner." That is one of the simplest forms of contract that we have in this business, but it contains various stipulations, upon which depends really the value of the contract, independently of the price; the question of the quality of the tallow, its being of this year's break; the time of its shipment, and also the manner of its shipment; all these are stipulations which are necessarily the subject of negotiation, through the brokers, with the other party; and I conceive that it would be quite impossible to be certain that the other party has agreed with you upon that sale, unless those stipulations were reduced to writing.

144. Lord *Stanley* of Alderley.] Is there anything in the proposed alteration of the law which would preclude you from requiring those written engagements in all future transactions?

There is nothing which would preclude us from using written contracts, but there would be a very great danger to the merchant if written contracts were not the rule. Those contracts being delivered to him shortly after the contract is supposed to be made, he has an opportunity of revising it, and if the terms are not consistent with what he considers to be the treaty, he returns the note to the broker, and the contract is either null and void, or it is amended by agreement between the parties.

145. Would not the complicated nature of this contract make it necessary upon all occasions to have it in writing?

I conceive that convenience would require that the written contract should still be used, but we should lose the protection of having an opportunity of revising the contracts which were made if written contracts were not delivered to us.

146. Did you not just state, that convenience required that you should use them, and therefore would it not be necessary that you should require written instruments for the satisfactory conduct of your business?

I should imagine that if a broker asserted that he had made a parol contract, that would be binding upon the merchant, whether he delivered a note or not.

147. *Lord Privy Seal.*] Would a broker be listened to if he came forward with the assertion that a practice quite unusual and unknown in the trade was in this particular case employed by a particular merchant, the particular merchant denying it, and the uniform practice of the trade being in opposition to it?

I conceive that in the various contracts made in business there may be continually cases where the broker may suppose a sale to have been made which the principal did not intend to make.

148. Are there cases now, under the Statute of Frauds, where a broker does imagine such a transaction to have taken place?

Constantly it happens that sales are supposed to have been made which, when the note is sent in, are rejected as not having been made.

149. Supposing the case of the practice of the trade to arise, owing to the complicated nature of the transactions, that no contracts are admitted by the principal, of which he has not the notes within a given short period; do you believe that any jury would give a verdict, if that were the practice of the trade, in a case where the broker came forward and stated that he had not complied with the usual practice of the trade, but had only entered into a verbal contract?

I should very much object to being brought into a Court of Law to resist a contract, which I have the means by the present law of simply rejecting by a revision of the broker's note.

150. If

150. If you simply say, I never make a contract excepting under such circumstances, and all the persons engaged in a similar trade never do, would not that be a perfect protection; is not there a vast amount of transactions only protected at the present moment by a reference to the custom of the trade?

I conceive that of the mercantile transactions in the City of London, a very small proportion is done except upon written contracts.

151. Lord *Overstone.*] The obvious, clear and unquestionable convenience, and even necessity of the case, would create the practice even under the supposed alteration of the law; and your objection I understand to be, that that practice is now sanctioned and upheld by law; and that if you passed the Bill now under discussion, that practice would be left, without the support and sanction of the law, to rest upon its own inherent value?

There would be no security to the merchant that he would not be held to contracts that he never had the intention of concluding.

152. The course of your business involves the necessity of entering into transactions, the details of which are complicated; and to prevent frauds and the honest ambiguities that would arise under such transactions, it is absolutely necessary that the agreement between the parties should be seen in writing before it is held to be binding and settled between them?

Yes.

153. And under the existing state of the law that practice you feel is supported and upheld by the law?

It is so.

154. And you come here to complain against the clause of the Bill which proposes to take away from you that protection which the law now gives you?

I should complain of the proposed alteration, inasmuch as it would take from me the power of revising the contract which is made for my account.

155. You have considered this clause in this Act carefully with reference to your own business, and the conduct and management of that business?

I have done so.

156. Do you feel serious alarm and apprehension as to the effect of this clause, if passed?

I do so; I think that it would destroy the security of the dealings of the merchant.

157. And that is your opinion, after carefully examining the subject, and looking to its operation upon your business?

It is so.

158. You feel that you would, if this clause were passed, be exposed to dangers both from fraud and natural misunderstandings, from which you think you have now a satisfactory protection?

Yes. The desire of the brokers naturally being to make a contract running no risk, they naturally outrun the intentions of their principals, and they often assume an authority which they really do not possess in concluding a contract. At present even they sometimes declare that they have had an authority to conclude a contract, which is only brought to the test by the written document. Supposing that clause of the Statute of Frauds to be repealed, there would, I apprehend, arise constant cases of disputes where the broker would say, I had your authority, and I have concluded such and such a contract, and I have delivered such and such a note to the other party. I do not conceive that there would be any defence against that, excepting the declaration of one principal. The broker's declaration appears to me to be as good as that of the principal, and the broker would be held by the other principal, who would say, "Either you must establish that contract, or I shall hold you responsible for it." The broker's interest therefore naturally will be to establish that contract, and in that way the merchant would constantly find himself fixed by a contract where he had not intended to go beyond a treaty.

159. *Lord Privy Seal.*] What is to prevent you from refusing ever to employ a broker again who did not comply with your strict instructions to him, that he should proceed hereafter just as now, bringing you these notes immediately

T. M. Weguelin, Esq.

21st May 1856.

diately after the transaction, and you refusing to recognize any transactions which had not this warrant for them; would not a broker stepping out of the usual practice of trade to bring forward parol evidence, when the notorious practice was to require a written contract, lose caste if such were the understanding of the trade?

I apprehend that the risks are not equal; the broker risks not being employed again; but the merchant may be ruined.

160. Would not the merchant be supported by the custom of the trade?

That would depend very much upon the value put upon the merchant's testimony and the broker's.

161. I understand that you think a particular class of transactions is so complicated as to require written documents; but for that purpose do you think it right that because a certain class of transactions is so complicated as to require the sanction of a written contract, all other transactions, whether complicated or simple, should be put under that necessary obligation, and be put beyond the protection of the law, for the sake of protecting a particular class, which class may protect itself by an understanding amongst themselves?

I have no objection to an alteration of the Statute of Frauds, provided you leave the security which the merchant now enjoys. Any alteration made in the Statute of Frauds, so as to include that particular class of contracts to which your Lordship alludes, the merchants have no objection to whatever.

162. Is there not much in mercantile transactions that is dependent upon custom rather than upon distinct enactment?

I think that mercantile transactions on a large scale are almost wholly confined to written contracts.

163. With regard to the question of the value of checks, is it not constantly the custom among merchants or bankers that the members of the trade are appealed to to decide the question of liability?

Decidedly.

164. *Chairman.*] You consider your present security to consist in this, that a broker can only enter into a contract, so as to bind you, by reducing the contract into writing, and giving you a copy of it within 24 hours?

Yes.

165. And you power then to repudiate it?

Yes, if it is not in conformity with the treaty.

166. Do you consider that to be a right given to you by the Statute of Frauds; that is a question of under what circumstances you have constituted him your agent, is not it?

It is the general opinion in the City of London that a broker's note, which is a copy of his contract in his own book, constitutes a contract if adopted by the principal.

167. What is there to prevent your doing it in the same way in future?

There is nothing to prevent our carrying on business by written contracts, but we complain that we shall lose the power of revision and rejection.

168. Lord *Overstone.*] If the clause in question be passed, you will still have the power of conducting your business with written contracts, but you will also be subjected to the danger of having imposed upon you as a contract something that has not been reduced to writing; that is your apprehension?

Yes.

169. That is founded upon your knowledge and experience as a merchant, and you are advised that such will be the legal effect of this clause, if it is passed?

Assuredly so.

170. If such will not be the legal effect of the clause, then your objection falls to the ground; but if such is the legal effect of the clause, then your objection remains in full force?

Certainly.

171. Earl *Grey.*] Would there not be this danger, if force is given to these parol contracts, that persons might design, two or three together, getting into conversation with a merchant, and afterwards in a Court of Law swear that he had entered into a bargain with them which might be perfectly ruinous?
There is that danger.

172. Lord *Stanley* of Alderley.] Might they not also forge a contract?
A contract which is forged may be rejected.

173. Earl *Grey.*] The Statute of Frauds was passed because it was found that the absence of written contracts did give a facility for frauds, and you apprehend that the proposed clause would re-establish that facility which has been guarded against?
I think that possibly frauds might be committed if the Statute of Frauds is repealed in the manner which your Lordships indicate; but I am more apprehensive of the misapprehension of the broker outrunning the intentions of his principal, and concluding a contract, and binding his principal in a manner which he did not intend.

174. *Lord Privy Seal.*] You are supposing the case of an honest broker; what inducement would there be in the case of an honest broker, not wishing to deceive, not to comply with the custom of the trade, and give the security which you expected from him?
Your Lordship will understand that the broker is the broker of two parties, the buyer and the seller, therefore it is not the broker alone that is interested, but the other party also; and if the broker, under a misapprehension, has made a contract with the other party, which is, however, denied by either the buyer or the seller, it is no plea to the person who admits the contract to say that the other party rejects it, because then he holds the broker responsible; therefore, the broker's object is naturally to establish the contract that is made.

175. Lord *Overstone.*] I think I understood you to state, that in the course of your business, misunderstandings as to the nature of contracts have not unfrequently arisen, and have not been discovered until the written contract was delivered in, and upon the delivery of the written contract those misunderstandings have been cleared up and adjusted?
Constantly so.

176. With regard to those cases, are there not many in which no imputation is cast upon the integrity of the broker as to the misunderstanding that has arisen?
Certainly.

177. They are genuine, honest misunderstandings, arising entirely from the ambiguities which attend oral communications, as compared with the greater accuracy and certainty of written communications?
Certainly.

178. And it is upon that ground that you wish to retain, for your protection in trade, the accuracy and security which you believe you have hitherto derived from the necessity of having written contracts, and which you believe you will be exposed to the danger of losing, if you are subjected to having verbal engagements imposed upon you as binding?
Certainly.

179. Lord *Stanley* of Alderley.] Would not the necessity of having written documents make it to be so invariably the practice of the trade that no broker would ever enter into any engagement for his principal except upon written contracts, they being essential to the satisfactory conduct of business?
I can hardly answer the question as to what would be the custom.

180. Not even supposing the case of a dishonest broker: if it was so invariably the practice of trade, would it not be a sufficient inducement to the broker so to conduct the business according to the wishes of his principal, that he would never transact it in any other way, because he would cease to be employed?
I conceive that the custom would still be to employ written contracts, but it would still give no security to the merchant; there would be no legal security to the merchant that he would not be bound by a parol contract.

T. M. Weguelin, Esq.

21st May 1856.

181. Would not the fact practically be that no business of this description would ever be transacted except by a written contract?
I am not prepared to answer that question.

182. *Lord Privy Seal.*] The danger which you apprehend is this, that an honest broker, the practice being habitually in such cases to proceed by written contracts, will hereafter occasionally bring forward a case of parol engagement in spite of that practice?
I think so.

183. Earl *Grey.*] In those cases of misapprehension which you say now sometimes arise, when the broker sends in a note, and one party finding it not what he intended, would it not be possible for the other party, under the proposed alteration of the law, to say that the broker's notes were not necessary to complete the contract, that the contract had been made, and to call the broker in as a witness, and hold the other party to a disadvantageous bargain which he did not mean to enter into?
I conceive that quite possible; the broker may state, "I have had your authority to make such and such sales;" and the rejection (if this law were altered) of the written contract would not alter that condition of affairs; the broker would still maintain that he had had the authority. But now the broker cannot maintain that he had the authority of the merchant to make this sale if the merchant rejects the contract when it is sent in.

184. Lord *Stanley* of Alderley.] The parol evidence might be set against the written evidence?
Not the written evidence, because that would be rejected.

185. *Chairman.*] The security which you now feel arises, as I understand you, from the fact that in order to make any contract binding upon you, it must be embodied in the note delivered to you by the broker?
Yes.

186. If, according to the present state of the law, the broker could bind you without delivering it to you, then you think that the law is imperfect now?
Yes; I should think that the law was imperfect.

187. *Lord Privy Seal.*] You are afraid that a parol transaction, previously to its being consigned to paper, might, under the change proposed, bind you irrespective of this paper?
Yes.

188. *Chairman.*] According to the usage in the City of London, are there particular brokers in particular trades, or are they generally acting in all trades?
I conceive that any sworn broker of the City of London may act in any trade; of course there are certain brokers who are habitually employed in particular trades.

189. In your own trade, what number of brokers are there?
They are not numerous; perhaps some eight or ten or twelve.

190. They are all well known to you?
They are mostly well known to us.

191. What would be the difficulty of giving them a general direction in writing, saying, "I will never be bound by any contract that is not carried on by bought and sold notes in the way heretofore practised?"
If that afforded us perfect protection, that would probably be the course pursued; but I conceive that in cases of difficulty that would hardly afford the merchant sufficient protection. Generally speaking, there are various seasons when trade is much more active than at others; the course is usually for the trade perhaps to remain with very few transactions during a considerable period, and then suddenly, owing to some excitement in the market, a very large number of transactions are crowded together in a very short space of time; it is quite possible then that in the hurry of business a broker, having numerous negotiations to carry on, may quite honestly make mistakes as to the authority given him by his principals, and he may conclude contracts which his principals never intended; that, I think, without reflecting at all upon the brokers,

brokers, may constantly happen. The only security that we have now that such a thing would not take place is, that when the broker's note is sent in to the merchant, he has power to say, "I never concluded this contract," and to return it.

192. Are you not aware that that will remain just the same after the passing of this clause, because that is a security which you have, not by virtue of the Statute of Frauds, but by virtue of the usage of the City of London; that is only what is considered as evidence of agency. Till you had received back and assented to the bought or sold note, as the case may be, the broker was not your agent to bind you; are you aware that that is the legal view of the effect of these bought and sold notes?

If, under the alteration of the law, we are still not to be bound, excepting by a broker's note accepted by us, I think that the objection of the merchants would be very much lessened.

193. Under the existing law, you are not supposed to have authorized the broker till he delivers the bought and sold note; if, under the altered law, the same course is pursued, do you see any difficulty in the alteration proposed?

I conceive then that the law would not be altered, so far as the merchants are concerned.

194. Lord *Overstone.*] Are you aware of any inconvenience ever arising from the present state of the law requiring written contracts?

I know of none. In my own business, certainly, the practice has been invariably to use written contracts.

195. You have extensive intercourse with the City of London generally; have you ever heard that the circumstance of the law not enforcing contracts in writing, and requiring written contracts, is the subject of general complaint?

On the contrary, I may state it as my knowledge of the City of London, that when the alteration of the law was proposed, everybody was taken by surprise, and the astonishment was about equal to the alarm.

196. Earl *Grey.*] There is a general apprehension in the City of London as to the consequences of dispensing with the necessity of written contracts?

A very general apprehension.

197. Can you state to what extent there may be a difference of opinion upon the subject in the City of London?

I conceive that the petition presented to the House of Lords represents the very general state of feeling on the matter. That petition is signed by the first houses in almost every branch of the trade of the City of London.

198. Do you think that the apprehension that was excited when the Bill was brought in, has been at all removed by any explanations that have been subsequently given?

On the contrary, I conceive that the more the subject is debated amongst merchants, the less they are in favour of the alteration.

199. Lord *Overstone.*] You have no hesitation in saying, from your intercourse with merchants, and your high position in the City of London, that the feeling upon this subject is very prevalent, and very strong, and that they would be seriously alarmed if this clause were passed?

I have no hesitation in saying so.

200. I will draw your attention to an extract from the Appendix to the Second Report of the Mercantile Law Commissioners, page 110; it is given by Mr. Blair, the Treasurer of the Bank of Scotland: he says, at page 109, "An assimilation of the laws of the three kingdoms is very desirable, if it could be accomplished without sacrificing considerations of greater importance than the benefit sought. The English common and statute law cannot perhaps be fairly compared with the law of Scotland, which takes into view both law and equity; and the improvement might be to join these two branches of jurisprudence in England. In some respects, the mercantile law in Scotland seems to be settled upon a more limited experience than the law of England, both as to the number of cases, and the extent and importance of the questions at issue, and the

T. M. Weguelin, Esq.

21st May 1856.

practice of both countries seems occasionally to depart from the principle on which the law sets out; but the anomalies may, no doubt, be explained. A more important consideration arises from the different character of the three nations, which, taken along with settled habits and institutions, makes any sweeping or sudden alteration of the law extremely undesirable. A better illustration could not be given than the absolute failure of the attempt to ingraft the English trial by jury, in civil cases, on the law of Scotland, which has entirely failed, from the difference between English and Scottish juries. When the differences between the law of the three countries are clearly ascertained, and have been carefully considered, it would seem best to carry on any process of assimilation very gradually, and rather to wait until the necessity for a change be clear and apparent, than to forestall the results of experience by theory, however plausible and brilliant;" do you not think that the principles there laid down are strictly applicable to this case; that it would be inexpedient, for the sake of any benefit to be derived from the assimilation of the laws, to impose upon so important a community as the City of London a new law upon this subject, respecting which they entertain the greatest alarm, and against the introduction of which they make a most strong protest?

I think that to assimilate the law, under which by far the more important community and the more important transactions are carried on, to that of a community of a limited character, and where much fewer and much less important transactions are carried on, would be highly objectionable.

201. Do you not think that the true principle of sound commercial legislation is to ascertain what course of business has been sanctioned by universal usage and universal approval, and to adapt the law to that course rather than the opposite mode of procedure?

I conceive that it would be much more desirable that the law of Scotland, in this case, should be assimilated to that of England, than that the law of England should be assimilated to that of Scotland.

202. My question was rather with regard to the general principle, whether the true mode of wise commercial legislation is not to take the practice that has existed for a great length of time, and with the general concurrence of the parties affected by it, and to make that the law?

I conceive that that is the true principle.

203. In a case in which the practice is different in two different parts of the country, is it not necessary, as the next step of wise commercial legislation, to take the law from that practice which prevails over the most important part of the community, as to the magnitude, extent and variety of their transactions?

That seems but natural.

204. Have you any doubt that the mercantile transactions now under discussion are far larger in London than in Manchester or in Scotland?

I think they are very much larger in London than in either the town of Manchester or in Scotland.

205. *Lord Privy Seal.*] Do you mean to say that all transactions, great and small, in London, and all over England, are carried on by written contract in compliance with the Statute of Frauds?

I conceive that by far the major part of what I may call mercantile transactions, the transactions of merchants, are carried on by written contracts.

206. Is the operation of the Statute of Frauds confined to the transactions of merchants?

The operation of the Statute of Frauds, I believe, includes every contract above 10 *l.*

207. For the sake of the advantage of one class of the community, the protection of the law is denied to all the other classes?

I conceive that other classes have an opportunity of availing themselves of that protection.

208. But their own convenience dictates to them that they should rather forego the protection of the law than gain it at a certain amount of inconvenience; is it not practically the result that a large portion of the trading community, in

in different degrees, has no protection from the law, for the sake of certain important transactions in the City of London, or other mercantile places?

I conceive that the fact that a large number of transactions are carried on without the protection of the law at present, is a proof that there is no particular inconvenience in the present state of the law.

209. Lord *Overstone.*] You mean that if there was great inconvenience from those transactions being carried on verbally, the merchants would resort to written documents for the purpose of obtaining that protection?

Yes.

210. And where parties do not resort to those means, it is because they do not feel any great evil to arise from the want of those means?

Precisely.

211. *Lord Privy Seal.*] It may also be understood that the inconvenience of having recourse to written contracts in every particular transaction is so great, that persons rather prefer running some risk than complying with that provision?

It may be so.

212. The question is the balance between the interests of two classes of the community, it being possible also that one important class of the community may protect itself by its own custom, just as much as another class of the community at the present moment?

The interests of both classes are provided for by the Statute of Frauds: the mercantile class avail themselves of that provision. The retail class do not avail themselves of it, because it is more convenient for them not to avail themselves of it: but it appears to me to be no argument against the law, as it at present exists, that a certain number of persons do not avail themselves of the protection afforded by it.

213. The law is made to cover a larger amount of transactions than it is of any value to?

Than is practically used.

214. It is of course a depreciation of the value of those transactions that they are open to being pleaded under the Statute of Frauds?

I conceive not. The transactions are carried on to a very great extent, not formally under the Statute of Frauds, but even where the formal conditions of a contract are not observed. I believe it will be found that in Manchester, for instance, to a very considerable extent, there are certain memoranda passed from hand to hand, which constitute, or which might probably, by a certain construction of the Statute of Frauds, be classed as contracts. The common practice at Manchester is to deliver the sold note, but not to deliver the opposite; there are not two notes delivered; but the general practice there is certainly to deliver to one of the parties to a contract a certain memorandum of the bargain. It is very true that that cannot be brought into a Court of Law as a contract, but it is an effectual document to which cases of arbitration may be referred, and are occasionally referred.

215. You conceive that the effect of the Statute of Frauds is beneficial, indirectly, even where it is not brought into operation to its full extent?

I think that the Statute of Frauds is grounded upon the law of necessity, and that you cannot carry on mercantile transactions of any importance, or of any complication, without reducing them to writing.

216. Lord *Stanley* of Alderley.] How do you consider that business has been carried on in the whole of Scotland without the legal necessity of such a law?

I have no evidence before me as to how the business of Scotland is carried on: I suspect, if it were carefully inquired into, it would be found that memoranda, similar to what I have mentioned with regard to Manchester, are the rule rather than the exception.

217. What should prevent such a practice being continued in Scotland and adopted in England, even in the event of the alteration of the law, as proposed in the present Bill?

There would be no reason why it should not be continued to be carried on:

T. M. Weguelin, Esq.

21st May 1856.

but certain people do not consider it necessary to avail themselves of the protection of the Statute of Frauds. That appears to me to be, however, no argument against that class of persons who desire to avail themselves of that protection.

218. Lord *Overstone.*] Your fear is not that the habit of having written contracts would be universally, or even generally dispensed with; but a new danger would be added, that of having, in some cases, contracts thrust upon you in writing, which you never intended to be so?
Yes.

219. Earl *Grey.*] I believe the Statute of Frauds is satisfied by the simplest possible form of writing,—a mere letter or memorandum is sufficient?
Yes.

220. Something that can be given with exceedingly little trouble?
Yes.

221. Therefore, if in a number of small transactions it is dispensed with, it is only because the parties consider that they can rely upon each other's honour?
Yes.

222. Is not it a less grievance to the parties who voluntarily dispense with a written contract which they may have by a little trouble, that they should occasionally be at a loss by making mistakes in the case of persons whose honour they thought could be relied upon, than that persons engaged in large transactions should be exposed to the risk of having bargains which might be of a ruinous nature thrust upon them, which they never meant to contract?
There can be no comparison of the risks. There is an amazing difference between the risk of having a small contract rendered null by a person's repudiating it, and having a contract forced upon you which you never intended to make. With regard to the relative importance of the contracts between wholesale and retail dealers, and those entered into by merchants, inasmuch as a portion of the wholesale and retail transactions are carried on by written contracts, and as it is the same goods which are sold originally by the merchant, the relative importance must necessarily be on the side of the merchant, because it is the same goods that are sold.

223. *Lord Privy Seal.*] That is supposing that all internal traffic consisted of imported goods?
Yes. I spoke of the business of the City of London.

224. *Chairman.*] Your business as a merchant is chiefly with Russia?
Yes.

225. Have you been in the habit of chartering ships yourself?
Constantly.

226. You always have that in writing?
Yes.

227. Are you aware that that is not necessary by law?
I was not aware of that.

228. The terms would be much too complicated to trust to verbal engagement?
There is a class of transactions which are conducted upon brokers' freight notes. Room may be engaged in a vessel verbally; but the whole vessel, if engaged, is I think invariably made the subject of a charter-party.

GERMAIN LAVIE, Esquire, is examined as follows:

Germain Lavie, Esq.

21st May 1856.

229. Lord *Overstone.*] YOU are a partner in the firm of Oliverson, Lavie and Peachey?

I am.

230. You have heard the evidence which has been given by Mr. Freshfield; have you anything to add to what he has stated?

By the Statute of Frauds it is provided, that the contract must be in writing, and signed by the party to be charged, or by his agent duly authorized. At the time when that Statute of Frauds was passed, certainly brokers were not thought of. Brokers now are men who go round to the different merchants. They are not the agents of any one individual; they are not the agents of the buyer or the agents of the seller; but they become, generally speaking, first the agents of the seller; because it more frequently happens that they are employed by a person who has something to sell. The broker goes to a merchant whom he supposes likely to be a buyer; he is not that man's agent; he talks with him; he learns what his wishes are; and when he finds that the wishes of the buyer and the wishes of the seller pretty nearly correspond, he then puts down in writing that which is to be the contract according to the Statute of Frauds. I venture to submit to the Committee, that he is no agent at all of the buyer until he has done this act. It is the ratification of that act by the merchant that makes him an agent, and he then becomes the agent "duly authorized," according to the words of the Act, and then it is binding upon the principal. A custom has grown up in the City of London founded upon that, for it is an invariable rule for the merchant to be at liberty upon the following day to send back the contract, and say, "That is not what I authorized:" he has a right to do so, because he has not confirmed it. When a broker comes into the counting-house, the merchant does not say to him, "I constitute you my agent;" he does not say, "You are my agent now for the purpose of this;" he says nothing upon the subject. That man is not his agent until he becomes so by the merchant ratifying the contract which he has made. That is the value of that part of the Statute of Frauds. I say, therefore, that now a broker cannot thrust upon a man a bargain which he never intended to make; but if you do away with this Act of Parliament, then when the broker goes into the counting-house of the merchant,—he, by the alteration of the law, would become, not as at present, the agent duly authorized when he has made the contract to the satisfaction of the merchant, but actually a person authorized in the first instance to make the contract. He goes into Mr. Weguelin's or any other merchant's counting-house, and talks with him, and he goes away and considers that he has made a contract. [I will assume that the course of business which you recommend is introduced, and I have no doubt it would be introduced.] He sends then the contract in to the buyer, and the buyer finds in that contract terms which he never thought of at all, and he says, "Why, I never intended to make a contract of this sort;" but the broker says, "You have made a contract with me; I was authorized by A., the seller, to deal with you; I came to you to sell; it is true your requisitions are, that the contract should be put in writing; but I say to you, you have made a contract with me, and there is no Statute of Frauds which requires anything to be in writing; you verbally agreed with me; that term which you disagree to now, I say, you actually did agree to, and I say you shall not be off it." I consider that that would introduce the greatest possible laxity. A contract is made now according to the law in writing only. Under this new law, supposing you do away with the Statute of Frauds, then assume the very case which the Lord Chancellor suggested, of an alteration made by the extension of time,—I believe it is a very valuable thing that such extension cannot now be made by parol. The construction which the Judges have put upon the law is, that a contract shall not be altered by parol; and if you are to introduce a law now, to say that the contract may be made by parol, of course you introduce that it shall be altered by parol, and then you put the merchant at the mercy of the middleman, because, though a man may be ever so circumspect in requiring a written contract at first, you cannot prevent a broker saying, "I had a discussion with him some time after the contract was made, and he agreed to contract that instead of the goods being

Germain Lavie, Esq.

21st May 1856.

delivered in the first three months of this year, they shall be delivered in the first three months of the next year." The merchant never intended any such thing, —and yet it is to rest upon parol evidence,—and I think that very dangerous. I do not think that this law ought to be forced upon Scotland; I think it is a question of the balance of convenience as to the two countries. I believe that the whole population of Scotland is about as large as the population of London; therefore the transactions in the whole of Scotland are comparatively insignificant; but when you find that this practice is so well recognized and approved of by this great community here, it seems to be a question of policy whether you will alter it merely for the sake of the assimilation of the laws. That is a very good thing, no doubt, but it may not be necessary, and may be too dearly bought. According to the custom in London, the business is conducted through middlemen, which will always make them the repository of these contracts; and I think you will have no end of those very frauds and perjuries which the Statute of Frauds was intended originally to prevent. The Lord Chancellor has alluded to charters. It is very true that they are not made without writing, but it is because they are of that complicated character, and cannot be otherwise, and all complicated agreements must be put into writing; but that is not really the question. I should submit to the Committee, that when you have an Act that works well, the question is, whether you are to alter it for something which is problematical.

231. *Lord Privy Seal.*] Are there not other questions constantly in the Courts in which the right or wrong is decided by an appeal to the custom of the trade; merchants being called in on both sides to bear witness to the custom of the trade?

Yes.

232. If you had the whole of the Russian merchants coming and telling you, "It is our practice never to recognize a transaction except one in this particular form," would a jury of the City of London believe a broker making an assertion in opposition to the uniform practice of the trade?

I will not say that they would not.

233. Lord *Overstone.*] Is not that assuming that you resort to a practice to supply a deficiency of the law?

The question is, whether you are to make an alteration of this existing law which on the whole works well; it is a small point of consideration; but in this large country of England, it really appears to me to be a very great protection that a gentleman may be able to go into a shop where he may wish to contract for something above 10 *l.*, and do everything he likes with perfect safety, and not be bound unless he does some act to take the article: if he accepts the article, he is bound by the law as it stands; and it is a very great protection against that perjury and fraud that may be committed, even independently of mercantile transactions.

234. *Lord Privy Seal.*] Have you known cases of hardship where a real transaction has been voided by reason of the absence of a written contract?

I have not; but I have seen this case repeatedly, certainly as many as six times,—in one case it went so far as to proceed almost to litigation: A broker comes to a merchant; he has been at his counting-house, and has talked with him about the price of particular articles, but has no express authority. The broker then has sent him in a contract, and the merchant has sent the contract back, and has said, "I never authorized that contract." I have been consulted upon the subject, and I have said, "You are not liable till you have taken that contract; you never authorized that man; you never made him your agent." In one case the man actually went to law; but he gave it up. Now, these are cases which arose even under the present law; and in each of those cases I will be bound to say that the broker alleged everything which was necessary to be alleged against my clients, and which would have fixed them, if they could be fixed, by a verbal contract, on the evidence of the broker. I found that it was invariably said by those who consulted me, that such and such terms were there, which the broker had improperly put in the contract, and which the merchant had not authorized. My clients in each case were respectable men, and they proved that they never gave the broker any such authority as he assumed. In one case particularly my client said, "I never authorized the broker

Germain Lavie, Esq.

21st May 1856.

broker to sell at all; he knew that I was not a seller, and yet he made the contract, and sent it in, and afterwards claimed to have his brokerage paid upon the contract." I have no recollection in any one of the cases to which I have alluded, of there being any change in the market, because in each I was consulted on the very day, or the next morning. I think that those are the dangers. It is not that the new system may not work very well by-and-by, but you go through the experiment, and make a great alteration, and a great organic change, which may be a benefit, with no possible mischief; but it is most likely that it will go through an immense quantity of litigation. A gentleman in the City of London, with whom I had some conversation upon the subject, said, "Why are the lawyers opposing this alteration? for they at all events will be benefited by it."

235. Is it the common custom of Europe, in the commercial cities, to admit no evidence of a contract that is not on paper?

Some contracts *must* be in writing; all contracts for ships must be in writing; all contracts for the sale of lands must be in writing. I believe in most foreign countries there is a formality (not so strong as our Statute of Frauds) that requires most things to be in writing.

236. Lord *Stanley* of Alderley.] How is it in America?

I attach more importance to America than any other country, for the American people are the most practical men: there is only one State in America which has given up the Statute of Frauds; and if you look at Story or Kent, you will find that they all approve of the Statute of Frauds.

237. Which State is it that has given it up?

I do not recollect, but I think it is the State of Massachusetts. We have laid down the rule, that a ship shall not be transferred except in a particular way. I know one gentleman, who is a great supporter of the proposed change in the law, who says you are excluding evidence. I say it is not so. You only say that a certain thing shall be done in a particular way; and you are preventing any mode of making a contract that is liable to ambiguity.

238. It is saying that you shall only receive one description of evidence, namely, written evidence?

You say with regard to a ship, that it shall only be transferred in a particular way; and with regard to land, that it shall only be transferred in a particular way.

239. *Lord Privy Seal.*] Are you not imposing that restriction upon all contracts which is only valuable with respect to a particular class; and are you not stripping contracts of that protection which they would otherwise enjoy?

I think that it is in reality not stripping contracts of protection, but preventing improper contracts being set up. I may observe, that verbal contracts (in a shop, for instance), are nothing compared with the larger transactions in the country. Is it better that the shopkeeper should have the power of imposing upon you, by falsely alleging that he has sold you a certain thing that you have agreed to pay 100 guineas for, when you have only talked of five guineas, or that he should not be at liberty to sue you for more than the fair value of that article, which is the utmost result that can happen; because, if he delivers you the article, and you keep it, and are dishonest enough to say that you will not pay for it, he can sue you, and the jury will award what you must pay—there is no mischief done.

240. *Chairman.*] The Statute of Frauds would not protect you in that case?

If an article is delivered and received, you have to pay the value of it.

241. If an article is received and delivered, evidence is admissible?

If it is received and accepted, then you are bound by parol evidence. If goods are actually accepted, it is quite true that then evidence is admitted. I ought to have put the case where the goods are sent; and the man sends improperly an invoice for 100 guineas, and you reject it. But will the Committee allow me to call their attention to this. The main objection that I have to this alteration of the law is, that contracts will be forced upon people which they never intended to make; there is some objection that the terms of the contract will be mi-understood; but the greatest objection that I have is, that a man will be contending somebody else made a contract with him which was never intended to be made.

Germain Lavie, Esq.

21st May 1856.

Now the Statute of Frauds says, "If there shall be an earnest, then parol evidence shall be admitted." If there is an earnest, it is quite clear that the two parties meant to make a contract. Again, if there has been an acceptance of the goods, it shows that there has been a bargain; the question, therefore, of there being some bargain is removed. I believe it would be more sound and wholesome if those exceptions had never been put into the statute at all. The greatest amount of litigation arises from those exceptions; and I believe that the Statute of Frauds, instead of being dealt with as the Committee are going to deal with it, would be much better if it were improved by doing away with those exceptions. But still those exceptions are supported, because they show that there has been a bargain; and then, perhaps, it is not unfair to say that the terms should be admitted.

242. *Lord Privy Seal.*] Very often the terms of the bargain are of more importance than the fact that the bargain has been admitted?

Yes; and therefore I would much rather that those exceptions were not in the statute, if we were making a new law: but we must deal with the thing as we find it.

243. In the case which was referred to, if a portion of the tallow had been delivered, parol evidence would be admitted as to whether it should be delivered in a certain time?

Those questions never arise in large transactions in the City at all. The exceptions in the Statute of Frauds never scarcely arise in the City of London.

Baron L. N. de Rothschild.

BARON LIONEL NATHANIEL DE ROTHSCHILD is examined as follows:

244. Lord *Overstone.*] YOU have heard the evidence which has already been given to the Committee?

Yes.

245. Do you concur in the purport of it?

I think that there is no occasion whatsoever for any alteration in the present law. We have a great many contracts every day, and there are very often mistakes in the contracts; but the contracts are sent back, and the mistakes are easily rectified; whilst if there were only verbal contracts, we should not know if a sale had been made, or we should have certainly a great many disputes, which we do not now have.

246. You think there is validity in all the objections which you have heard urged to-day against the proposed alterations of the law, and you concur in the general inconvenience that would result from letting in verbal contracts?

Yes, I think it would be optional then; it would not be quite decided; you would have a certain class of merchants agreeing amongst themselves that they would have nothing but a written contract, whilst another set of merchants would agree to have a verbal contract; so that instead of the law being similar all over the country, it would be introducing into London just that difference of opinion which exists now between England and Scotland, and therefore much more litigation would arise, and there would be much more dissimilarity of law in the United Kingdom than at present exists.

247. *Lord Privy Seal.*] Have you found inconvenience to arise in foreign countries where this provision exists, that there is less use of written contracts, or a greater uncertainty introduced by the use of parol contracts?

I have not been in any country where verbal contracts do exist: in the City, in the Stock Exchange, everything is done verbally, but then it is from man to man; there is no middleman as there is between the brokers. Feeling that it would be impossible in the Stock Exchange for the members to pass a written contract for every transaction, it is merely verbal, and entered in their books; but feeling the disadvantage of that, and how likely it would be to lead to litigation, every transaction is checked in the evening by their clerks; and without the transactions are checked by their clerks, they are not valid for the following day.

DANIEL MEINERTZHAGEN, Esquire, is examined as follows :

D. Meinertzhagen, Esq.

21st May 1856.

248. Lord *Overstone.*] YOU are an acting partner in the firm of Frederick Huth & Company?
I am.

249. That firm carries on very extended operations?
It is a large business.

250. You trade to Germany, and also to Spain, and a great deal on the coast of South America?
Yes.

251. You trade also a good deal to the Mediterranean?
Yes.

252. You also trade upon the Indian and China seas?
Yes.

253. So that your transactions are exceedingly large, and varied, and complicated?
Yes.

254. In the course of those transactions you are continually called upon to enter into transactions of purchase and sale?
Yes.

255. Are those transactions usually carried on through the medium of brokers?
Almost entirely through the medium of brokers.

256. Are they generally your own appointed agents, or are they accidentally intervening parties?
They are not our own particular agents; it is only in particular branches, perhaps only in one branch, that we have one or two special brokers; in all other branches we consider it our duty to our constituents (as we do our business entirely upon commission) to be open to all brokers; we do not consider ourselves authorized to bind ourselves to any one broker; any broker who makes us an offer for any goods that we have to sell, or who offers us goods which we require to buy, we listen to, and treat with him, if we agree upon the terms.

257. Your transactions are frequently of the magnitude of entering into the sale of a floating cargo, and sometimes so minute as to dealing with a small quantity of sugar or indigo, or any other article?
Yes.

258. In the case of floating cargoes, are not your written contracts very often complicated?
Yes; very often a good deal complicated.

259. Did you hear the course of business narrated by Mr. Freshfield, with regard to floating cargoes, in the case of vessels coming across the Atlantic to Cowes and other ports, and being thenceforward sent to continental ports?
Yes. That is a description of business which has increased very much within the last 20 years, and which is still on the increase, from this circumstance, that formerly the merchants on the Continent were much less in correspondence with the Brazils, India, China and other distant countries. Their shipping was comparatively limited, nor had they the facilities nor the credit necessary for entering into direct operations with those countries. They consequently gave orders to London for sugar, coffee, or other articles which they required; but within the last 20 years, the trade of the Continent has grown so much, that they are now in direct correspondence with all countries. The course of business now is, that almost all cargoes ordered, for instance, by a house at Bremen, by a house at Hamburg, by a House at Antwerp, are directed in the first instance to the Channel, or to Cork, or Falmouth, or Cowes,

D. Meinertzhagen, Esq.

21st May 1856.

there to receive their orders. The reason of this is, that they cannot judge beforehand which market may be the most suitable on arrival; but by directing the ships to a British port, with which they are connected with by telegraph, they have the advantage of all markets, and can immediately ascertain and decide to which market it is most for their interest to direct the cargo to be sent. This business is also facilitated by numerous agents of all the principal cities of the Continent, who reside in London, and whose interest it is to purchase these floating cargoes for their principals, if there is the least margin. When, at the moment of the arrival of a ship, the prices of all the principal towns leave a loss, a sale is sometimes impossible, and the owner of the cargo has then to determine to which port he will direct the vessel, to avoid demurrage, and in such cases he will generally give the preference to London, because he knows that the London houses possess large means, and are willing to grant every possible facility. He knows that we have large and convenient docks; that the charges of those docks are comparatively small; and he also knows that if a demand springs up from any part, London is very probably the first market that will be resorted to. Consequently, that description of business concentrates itself more and more in the City of London; and it is, as your Lordship observed, of very great magnitude. Those cargoes frequently amount to 10,000 *l.*, 15,000 *l.*, or 20,000 *l.*; and are sold in one contract.

260. You often have to make a contract, have you not, with parties on the Continent, through samples, before the arrival of the cargoes?

Yes.

261. In making those contracts, they have necessarily reference to a variety of considerations, such as the quality and the quantity of the article, the price of insurance, and the terms of the charter?

Yes.

262. What is your impression with respect to the effect of this proposed alteration of the law with regard to contracts, as bearing upon that part of your business?

I cannot help fearing that it would give rise to great misapprehensions and mistakes, independently of the abuses which would necessarily arise from it.

263. Do you apprehend that that branch of your business would be exposed to serious dangers, arising from fraud and misunderstanding, if you had not that obvious and natural protection of being bound by nothing that you have not first seen in writing?

Certainly.

264. This is a course of business that necessarily is peculiar to ports, and cannot arise in inland towns?

No.

265. Therefore you would not be surprised to find that in inland towns there is not the same strong feeling of the necessity of written contracts which you think absolutely necessary for all the outports of the kingdom?

Certainly not. I alluded just now to telegraphic communications. At present the course of business is as follows: we receive advice from Havana, by steamboat, of a cargo of sugar, which is intended for the Channel and other ports; samples are also sent over by steamer; the moment we receive those samples, we send them to our agents at Hamburg, Bremen, Trieste, Antwerp, and wherever we think that the cargo may suit. Our agents then set to work to get orders for the cargo, and during the fortnight or three weeks which may elapse between the receipt of the samples and the arrival of the vessel, negotiations are constantly going on; then, perhaps, at the end of a fortnight or three weeks, the ship is telegraphed as having arrived at Cowes, Falmouth, or somewhere else; the ship very frequently has only one or two lay-days, after which a heavy demurrage becomes payable; consequently it is essential for the consignee of the cargo to effect an immediate sale within that short period, and it is to facilitate that sale that these preparatory measures have been taken of corresponding with the agents, and sending the samples backwards and forwards.

266. With regard to those preparatory conversations previously to the contract, would not they be seriously interrupted and cut short if you felt that out of those preparatory conversations it was possible that a contract might be saddled upon you by parol evidence?

Certainly, as the business is managed at present, it would be a very serious inconvenience: in fact, we should not be able, with the multitude of transactions that we have, to recollect what was mentioned either verbally or in correspondence two or three weeks ago; we may, for instance, on receiving advice of a cargo consigned to us, have told the broker we shall get this cargo, and are prepared to sell it. Our views are such and such a price, and with such and such conditions. Then when the ship arrives, as I mentioned, the transaction is concluded very rapidly; the broker who has been entrusted by us with the sale has, in the meantime, been consulting all the houses who export the article in question to Russia or other countries, and at last he may have got a party to accept the price which we told him, three weeks ago, we should be willing to take. He comes to us and says, "I have concluded the business, and I have got your price." Then we wait to see the contract, and it is only on seeing the contract that we can judge whether it is acceptable or not; and neither the broker nor we recollect distinctly, probably, the conversation which took place some weeks ago; so that there would be constant misapprehensions and mistakes, independently of any fraudulent design.

267. You think that those preliminary conversations and discussions, which are very convenient for the purposes of business, would necessarily be altogether suspended if a law was passed which enabled persons to establish a verbal contract against you?

They would become dangerous.

268. And that, you think, would be a very serious inconvenience and interruption to that which is now a beneficial course of business?

Yes.

269. Do you think that it would go to anything like the extent of really embarrassing you in the conduct of your business?

I think it would at first, at all events, very much so.

270. You would probably resort to various practices, amongst which would be the giving of notices to parties that you acted under none but written contracts, and various other contrivances which mercantile ingenuity would suggest?

Yes.

271. But would you not still feel that the want of legal sanction to those guards was a great deficiency?

Most certainly.

272. It would very materially interrupt and inconvenience any arrangements that you might resort to to mitigate, if not altogether to remove, that evil?

Yes, certainly; we should always fear that we were bound, between the period of the negotiation and the receipt of the contract, to terms which we did not understand or intend to accept.

273. I believe you receive cargoes of iron from Sweden?

Yes.

274. Would the same difficulty arise in that case?

It would be a difficulty of a different description; but in many cases it would be more serious there. We frequently receive a cargo of iron from Sweden, with orders to sell it, if we can do so on the arrival of the vessel for immediate transhipment into a ship going to the United States, and unless that can be done forthwith, the expenses of landing are incurred, which are considerable, so that there the contract must sometimes be concluded within a few hours. Our practice is to send word to the different brokers, of whom there are a great many in that branch, telling them that we have such a cargo of iron, and asking them to bring us offers. They come into our counting-house, one offering such

D. Meinertzhagen, Esq.

21st May 1856.

such a price, and another such a price, and we accept that which is most convenient.

275. Your intercourse with them, preparatory to a sale, would be seriously checked if you were subject to the liability of having a parol contract imposed upon you?

We should never know where we were.

276. Do you think the determination on your part not to recognize anything but written contracts would give you a protection against the danger of having a verbal contract established against you?

Not in many instances.

277. Do you deal largely in wool?

Yes.

278. What is the nature of your transactions in the wool trade?

Receiving consignments of wool from Australia, and partly purchasing wool for exportation to the different countries on the Continent.

279. How does the existing state of the law with regard to contracts, and the proposed change, affect that department?

There would be the same inconvenience of this intervening period between the negotiation and the receipt of the written agreement.

280. Have you any documents by you which would at all illustrate that?

I have here a number of contracts, some of a complicated nature, and others not so. If I may be allowed to read one, it will give the Committee an idea of their nature: "Bought for account of Messrs. F. Huth & Co., of our principal, in our names, 4,225 boxes (more or less) sugar, at 22 *s.* 3 *d.* per cwt., with $2\frac{1}{2}$ per cent. discount, being the cargo of the 'John Henry,' Captain Oxnard, from Havana, and for Matanzas, now waiting at Cowes for orders. To be taken at the invoice weight, calculating 100 lbs. net Spanish, as equal to 101 lbs. net English weight. The above sugar to be delivered from over the ship's side, at the usual place of discharge at Antwerp, as per charter-party, free of freight and insurance to the buyers. The policy or policies of insurance being for the full amount, with the exception of freight and primage, but effected free of particular average, to be delivered to the buyers for their benefit in case of total loss. The sellers agreeing to pay damage, if any, as if insured free, of 10% average, in series of every 50 boxes running invoice numbers, the buyers undertaking to pay, in case of damage, the sum of 100 *l.*, if the average amounts to more, or its full amount if it should be below 100 *l.* To be paid for by cash, on delivery of the bill of lading and shipping documents, allowing one month's interest at the rate of 5 per cent. per annum from date of contract."

281. Do you think that, under the proposed alteration of the law, the determination on your part to enforce such contracts in writing as those, so far as you could, would give to you a sufficient and satisfactory protection against the danger of having some other contract, or some new version of that contract, forced upon you, through verbal evidence?

Perhaps, on so large a contract as this, the risk would be less, because there are few persons with whom we could treat upon so large a cargo. The risk would be greater in smaller transactions.

282. In smaller transactions, such as those in wool, you think that the danger to arise from letting in verbal obligations would be much greater than in the larger and more complicated transactions?

I think so.

283. Upon the whole, the result of your great practical experience, as a merchant, dealing in all sorts of commodities, I understand to be, that you apprehend very serious inconvenience and danger, both in the management of your business, and with regard to your pecuniary interests, if verbal contracts are let in upon you?

I certainly should apprehend very serious inconvenience and danger from it.

284. Have you found any inconvenience from the existing state of the law?
None whatever.

285. Does it come within your knowledge, throughout all the mercantile transactions in the City of London, or in communications with other parties—have you heard anything that you could fairly call a complaint of the existing state of the law?
Until this alteration has been agitated, I have never heard any complaint from any one.

286. Did the proposal for this change come by surprise upon the mercantile community of London?
Yes.

287. Has it created among them well-founded alarm, in your judgment?
It has created great apprehension among the larger houses of London.

288. Do you believe that the representation made to this Committee, that the feeling of the trading and mercantile community of London is generally decidedly against an alteration of the law, is a correct representation?
Yes, most assuredly.

289. Do you concur in the grounds of that representation?
I concur fully in the grounds of that representation. I perceive that the petition is signed by nearly all the eminent houses in London.

290. I stated in the House of Lords, that the petition represented with remarkable unanimity the feeling of the trade of London; do you consider that I was fully justified in that statement?
I do.

291. And you concur in all the statements contained in that petition?
I do.

292. Lord *Stanley* of Alderley.] Are there any important branches of the trade in London which are in the habit of conducting their business by parol contract?
I am not aware of any.

293. Do you know what is the case with regard to the silk trade?
Yes, partly. We sometimes have transactions in silk.

294. Is it the habit of merchants transacting business in silk to transact their business by means of written contracts?
Just in the same manner. We should never consider ourselves bound to any contract unless we saw it in writing.

295. Lord *Overstone*.] Are not Morris, Prevost & Company, a house engaged considerably in the silk trade in the north of Italy?
Yes.

296. Have they signed the petition?
Yes.

297. *Lord Privy Seal*.] You consider that there is no means of giving protection to the interim transaction, except that of giving no validity to any contract which is not contained upon paper?
Yes; that is my feeling.

298. There is no means of giving notice to your agent, such as stating at the time, this is provisional, and subject to the final contract; there is no means by which safety can be given, except that of stripping all transactions above 10 *l.*, which are not upon paper, of the protection of law?
I see no means of securing ourselves in our varied business; but whether the transactions not requiring written contracts should be limited to 10 *l.* or 100 *l.*, is a question which may require consideration.

299. Would there be any practical difficulty in giving the broker a little note, saying, this is provisional, and subject to the final contract?
The City of London is so large, that frequently we do not know the parties we deal with, and we may know very little even of the brokers. There are

F. Meinertzhagen, Esq.

21st May 1856.

many brokers with whom we do business whom I hardly know by sight, and of whose character and standing we are not able to judge, but whom we cannot exclude in order to do justice to our foreign constituents. For this reason, we should not know to whom to give such a notice as your Lordship suggested: for instance, with regard to cargoes of iron, when a cargo arrives, one of us may be on the Royal Exchange, surrounded by a dozen metal brokers, some of them very respectable, and others less so; the member or representative of our firm enters into a conversation with them about this cargo, and is anxious to sell it. One of them makes this remark, and the other that remark; one, perhaps, even goes so far as to say, "I can give you your price." This may or may not be an actual offer; we do not consider it as a contract; we do not recognise any contract until we see it in writing, and especially in the case of articles which are sold on credit, because, in many cases, the broker may not name his buyer beforehand; we only see it by the contract; and in many instances names may be put into the contract as buyers whom we are quite unprepared to accept, and in those instances we return the contract; if all that was to be arranged beforehand by conversation, I fancy that it would render the business almost impracticable.

300. *Chairman.*] You consider yourselves at full liberty to return the contract if you do not approve of it when you see it?
Yes.

301. *Lord Privy Seal.*] Even supposing the parol evidence were correct, supposing the contract were in accordance with what you had said at the time, you would feel yourself at liberty, upon further consideration, either of the character of the party or the terms, to return the contract?
That is the practice.

302. That is understood?
That is understood.

303. *Chairman.*] The practice which is understood is, that you are not bound till you have assented to a written agreement?
Yes.

304. *Lord Privy Seal.*] Even supposing what passed on parol might be in accordance with what appeared on paper, it is considered that there is a *locus penitentiæ?*
I believe it is held to be so; but it would not be considered respectable.

305. At first you deal with the broker; but when you have the contract, you find the principal; and if the principal is a man whom you do not like to trust, then you would be at liberty, upon the ground of the principal, to reject the contract?
Yes, because the principal had not been mentioned.

306. Earl *Grey.*] It is a good ground for rejecting a person not having good credit?
Yes; any private reason which you might have.

J. J. Hubbard, Esq. and J. Cattley, Esq.

JOHN JELLIBRAN HUBBARD, Esquire, and JOHN CATTLEY, Esquire, are examined as follows:

307. Lord *Overstone* (to Mr. *Cattley*).] HAVE you heard the evidence given to-day?
I have.

308. Do you entirely concur in the feeling which that evidence has expressed in hostility to the proposed alteration of the law?
Almost entirely.

309. You anticipate the same evils, and upon the same grounds, which have been stated by the preceding witnesses?
Yes.

310. And you entertain that feeling as strongly as they have expressed it?
I do.

311. And you believe that to be a very prevalent feeling amongst all classes of the mercantile community in London?
Yes.
(Mr. *Hubbard.*) I think that any custom which was not countenanced by law, would have a very slow and ineffective growth, as any matter of protection against the law itself.

312. Lord *Overstone* (to Mr. *Cattley*).] I believe you carry on a considerable amount of retail business?
Yes.

313. Have you found any inconvenience in the course of that retail business in consequence of the present state of the law?
Never. I have for 45 years carried on a rather extensive trade, and have never had a contract disputed in my life; I have never had occasion to go into a Court of Law in my life.

314. Lord *Stanley* of Alderley.] Were those transactions carried on by written contracts?
By both verbal and written contracts; very largely by written contracts. My practice was, when goods were sold for forward delivery, invariably to take a written note of it. When they were sold on the spot, and might be delivered immediately, the contract was ended the following day, and in some cases we took none; but in neither case have we ever had a dispute about them.

315. A large portion of your business has been conducted, not in conformity with the Statute of Frauds, but merely by parol contract?
For 40 years I have scarcely been sensible that there was a Statute of Frauds; but I have a very considerable mercantile trade in addition to that, where it was quite indispensable, and which could not be carried on except by those written contracts.

316. Earl *Grey.*] In your retail business you find no want of security in the conducting of those transactions which are conducted upon honour, as they are not under the protection of the Statute of Frauds; and within your larger transactions you find great advantage from the protection against unauthorized agents which that statute affords you?
Quite so. With regard to the smaller transactions, I have never found the slightest difficulty; I have never had one disputed in my life.

317. Lord *Stanley* of Alderley.] Would it be productive of much inconvenience to your retail transactions if you were obliged in all those cases to take written contracts?
No, I think not; I have never found a difficulty in taking a written note. I have heard it stated that in very small trades the buyers object to sign a written contract; that, I apprehend, is for very small quantities generally.

318. *Chairman.*] Of what trade are you speaking?
I have been engaged chiefly in the Russian trade, but I have a trade with all parts of the world. With regard to the retail trade, I am engaged chiefly as a distributor of tallow. Mr. Weguelin, who has been examined, I dare say has found me for 40 years one of his largest buyers. That I have distributed all over the country, perhaps, four-fifths of it with these notes, but some without them.

319. What do you mean by retail trade?
We speak of that as retail which is not foreign.

320. You do not mean that you sell over the counter?
No, I do not do that.

321. Lord *Stanley* of Alderley.] There is a great portion of these large transactions which you have conducted without the intervention of written contracts?

J J Hubbard, Esq. and J. Cattley, Esq.

21st May 1856.

A considerable portion of that trade which is to be settled at once. I have not always thought it necessary to have a written contract in a transaction on Change, where I may sell articles to six different people. When I get home at night they are entered in a book, and the orders are executed, and there the thing ends; but in the case of being delivered a fortnight hence, a note has been sent.

The Witnesses are directed to withdraw.

Ordered, That this Committee be adjourned till Tuesday next, Three o'clock.

Die Martis, 27° Maii 1856.

LORDS PRESENT:

Lord Chancellor.	Lord Wrottesley.
Lord Privy Seal.	Lord Stanley of Alderley.
Earl Grey.	Lord Campbell.
Lord Ardrossan.	Lord Overstone.

THE LORD CHANCELLOR in the Chair.

JOHN HOLLAMS, Esquire, is called in, and examined as follows:

322. *Chairman.*] WHAT are you by profession?
A solicitor.

323. In the City of London?
In the City of London.

324. Have you had much experience of the mode in which mercantile business is transacted in the City of London?
I think I may say considerable. My business is chiefly connected with mercantile questions.

325. Will you state what, according to your experience, is the mode of transacting business in the City of London?
The mode of transacting business varies considerably, according to the subject-matter. With reference to the larger transactions, such as floating cargoes, that is, entire cargoes, I may state that the mode ordinarily adopted is to sell them through a broker who makes bought and sold notes; and other transactions which take place through brokers are always carried out by bought and sold notes. The broker makes his contracts in the day, and at night sends to the buyer a bought note, and to the seller a sold note; but the custom on the corn market is wholly different.

326. With regard to floating cargoes, and those classes of business ordinarily transacted by means of bought and sold notes, will you be good enough to state at what point of the transaction the contract is binding upon both parties?
I apprehend it is binding as soon as the broker signs any memorandum, which is sufficient within the statute. According to the regulations of the City, the brokers are bound to keep a broker's book, and some of the old-fashioned brokers adhere to that; but many brokers, having a very large business, and making many contracts, complain of the trouble that it gives them. They do not make regular entries in their broker's book, consequently the only evidence of the contract, in those cases, is the bought and sold notes.

327. At what point does the contract become binding?
I apprehend, if the broker makes an entry in his broker's book, that entry makes the contract binding from that time. If he sends bought and sold notes, from the moment at which he signs the bought and sold notes, the contract is binding, provided always that the notes correspond.

328. He sends the bought note to the buyer, and the sold note to the seller?
Yes.

 329. Suppose

J. Hollams, Esq.
27th May 1856.

329. Suppose either the buyer or the seller repudiates that, and says, "That is not what I authorized you to do;" what is the result?
Then, I apprehend, it depends upon what the verbal authority was. The question is quite open.

330. So that if, in fact, the seller authorizes the broker to sell something, say at 40, and the broker, having misunderstood that, sells at 35; and he signs the bought and sold notes at 35, and the buyer insists upon that, but the seller repudiates it, and says, "I did not authorize a sale at 35;" what are the liabilities then of the different parties?
That depends upon the question, which would be a question for a jury, which is correct, the broker or the merchant, as to what the authority was. I had a case within the last few days in which such a question arose, upon a conversation between a broker and a merchant, as to what the broker's authority was: there was a quantity of raisins; I think it was 100 tons; the merchant had authorized the broker to sell them at 44 *l.* 10*s.* a ton, if he could sell them at that price on that day; that was the broker's notion; but the merchant said I think "it was to be before Change time;" and that was the point upon which they were in dispute. The broker sent the contract, which the merchant next day returned, and said that he was not bound. In that particular case I believe the goods were afterwards delivered. I threatened proceedings against the merchant, relying upon the broker's evidence, confirmed by the evidence of his clerk. The merchant delivered the goods.

331. That was parol evidence?
Precisely so; and I apprehend it does depend upon parol evidence.

332. Lord *Overstone.*] That is parol evidence, explaining a written document?
No; showing an authority for a written contract. No question arose there upon the written contract; that was plain enough; but the seller said that the broker had no authority to make such a contract, and the broker said that he had.

333. The fact of there being a contract was reduced to writing before parol evidence was admissible upon any part of the question?
Yes; but that gave no assistance to solve the question in dispute.

334. *Chairman.*] There was no question in that case that the contract was a contract for the sale of 100 tons of raisins at 44 *l.* 10*s.* a ton, entered into upon a particular day?
No.

335. The question was a parol question, whether the merchant had authorized such a sale, unless it was made before a given hour?
Precisely.

336. Against that the Statute of Frauds does not protect you?
Not in the least.

337. Suppose the question is, whether the merchant has authorized a sale at a particular price, the broker having sold at a lower price than the merchant says he authorized him to sell at, exactly the same question would have to be decided by parol?
Precisely; and I have an action now pending where this question arises: the buyer says that he authorized the broker to buy oil, provided he was satisfied as to who the seller was, making it a stipulation that he must be satisfied as to the responsibility of the seller; the broker denies that; and that question is now pending.

338. Lord *Overstone.*] Is that a question between the seller and the broker?
No, between the seller and the buyer; if the broker is right, we apprehend that there is a good contract within the statute, because the broker had authority to make it; but if the buyer is right, that he only gave a qualified authority to buy, the broker had no authority to make an absolutely binding contract.

339. The two questions are, the authority to make that contract, and the fact of the contract being made; the fact of the contract being made must rest upon written

written evidence; and the authority to make the contract may still rest upon parol evidence; is that the case?

J. Hollams, Esq.
27th May 1856

Subject to some qualifications; it is not all contracts that need be in writing, indeed the Act does not require that any contract shall be in writing; the contract in all cases may be verbal, but it requires that some evidence of the contract shall be in writing, or that there shall be part delivery or part payment. The memorandum may be long after the contract. It is not the contract that is to be in writing, but the note of the bargain signed by one party.

340. The contract, so far as it possesses a legal character, must be in writing?

Evidenced by writing.

341. The law recognizes no existence of a contract till you produce some written document evidencing that contract?

It is rather a question of evidence than a question of contract; it is as to the mode in which the contract is to be proved; no contract is good unless some note of the bargain be in writing; but that need not be the contract; that need only be signed by one of the parties, not by both.

342. Still no bargain can be made binding upon the parties unless there be some written document to show the existence of such a bargain, and to assist the law in interpreting the nature of that bargain?

Yes; but that document need not be signed by the parties themselves, and need not be known to them; if they authorize a broker, and he signs a contract for them, that is a sufficient contract; and it need not be communicated to them but for the custom which steps in.

343. The first step in the case is, that a recognized agency renders the agent and the principal in law the same party for this purpose?

Yes.

344. Then we have now the contracting party on one side; that contracting party cannot be bound to any contract, or have any bargain, to use your own terms, constituted and construed into a contract, unless that party, principal or agent, commits himself to it in some form or other in writing?

No; but your Lordship is aware that the law, with respect to the way in which it is sufficient for him to commit himself, is not very satisfactory. Take the case of an auctioneer: a man walks into an auction-room, and nods his head to the auctioneer; that gives the auctioneer or his clerk impliedly an authority to sign a written contract; and upon this questions and difficulties arise: for instance, if the auctioneer should be selling for himself, it would not be a binding contract if he signed the buyer's name.

345. Do you mean to say that a nod of the head in an auction-room will bind the nodder?

Not in itself, but when the name is put down; that is the way in which the authority is conferred to the auctioneer.

346. Is it not the universal custom in all auctions, at the sale of an estate, that the moment the biddings are terminated a written statement of the last bidding is drawn up upon the printed particulars, and the parties are called upon to sign it?

In the sale of land, it is so, but not with the sale of goods. There is a distinction, not bearing upon that question, between contracts for the sale of land, and contracts for the sale of goods, under the Statute of Frauds, between the 4th section and the 17th section.

347. Is not it a constant occurrence in auctions, that two or three parties claim that they simultaneously made a nod of the head, and that as a matter of course it does not become a question of investigation which of those three makes a true statement; but the whole of those biddings are considered as null, and the auction from that point is re-commenced?

It is usual to have a condition to that effect, to avoid the litigation that might otherwise arise as to the authority.

348. Does not that clearly show a universal recognition of the inconvenience of rendering those very loose proceedngs binding; and does not it show

J. Hollams, Esq.
27th May 1856.

the necessity of taking every precaution to secure something of a more binding character?

I think not. When men nod their heads in an auction-room few think that they are authorizing the auctioneer to make a written contract for them, applying to conditions of sale which they frequently have not seen. I think I am justified in saying that one case decides that if the conditions are not annexed to the particulars, it is not a good contract; if they are annexed to the particulars, it is a good contract; and so the validity of the contract depends upon those fine-drawn distinctions.

349. Do you think that public justice, and the security and safety of transactions, are promoted by allowing contracts to rest upon those fine-drawn distinctions?

No; I think great evil arises from those fine-drawn distinctions; I think that this provision has given rise to them.

350. Do you not think that, in proportion as transactions are more complicated in their nature, or more important as regards their magnitude, it becomes necessary to take more effectual precautions for ascertaining that the parties mutually understand each other correctly, that they are knowingly binding themselves, and that their obligations are clearly understood?

I think that parties will always take care of themselves. In complicated transactions it is clearly expedient for every prudent man to put the contract in writing; but, in the case of simple ordinary daily transactions, I apprehend no writing is necessary.

351. Do you not think that it is the duty of the Legislature to assist parties in every reasonable way in taking care of themselves, rather than to throw them nakedly upon their own resources to avoid the difficulties which the law may throw in their way?

I think that it is hampering parties to point out to them a certain way of doing their business, and to say that they shall only do it in that way.

352. Do you think it is hampering parties to require that every transaction having reference to a guarantee shall be reduced to writing, or it shall be invalid; or to require that every acceptance to a bill shall be not verbal, nor upon any other document, but shall be in writing, and upon the document itself?

Those are exceptional cases. First, with reference to guarantees, they are comparatively of infrequent occurrence; and, as to the acceptance of bills, your Lordship is aware that this Act proposes to change the law upon that subject. It has not been necessary to accept foreign bills in writing.

353. Are you aware that this Act proposes to change the law upon that subject directly in opposition to the principle upon which it proposes to change the law upon this subject, namely, that it requires the writing upon the bill of exchange to constitute an acceptance to be more distinct and stringent than it now is; whilst, for the purposes of these contracts now under discussion, it proposes to render the means of enforcing them less stringent than they now are?

I am aware that this Act proposes to alter the law with reference to the acceptance of foreign bills.

354. Your argument was, that the introduction of the written principle into contracts was only hampering the public; how do you reconcile that doctrine with the doctrine and the practice recommended by the Commission, and adopted in this Bill, which requires that all acceptances to bills of exchange shall be more stringently in writing than they now are, and that all engagements with respect to guarantees shall be more stringently in writing than they now are?

I submit that the cases are wholly different. It has been the well-understood course of business, that bills are drawn and are left at the acceptor's for acceptance, and then checked and entered by the clerk, and the acceptor has merely to write his name across them. A contract is a different thing, it requires looking to; and, besides, it is not already written. Men may make contracts upon a public market, where they have not the convenience of writing.

355. You state that contracts require looking to; is not that the strongest ground upon which to found the conclusion, that therefore they require reduc-

tion

tion into writing to enable that looking to them to become efficient and certain?

No, I think not; because there are many terms which are quite understood when men are bargaining for particular goods, which, if they were to put the contract down in writing, it would be necessary to explain.

356. Does not your business as a solicitor consist principally in acting for large wholesale houses in the corn trade?

No, I should say not.

357. You are employed considerably for houses in the corn trade?

To a certain extent.

358. Do you know the course of business with regard to transactions in the corn trade?

I think I do.

359. Have you been accustomed to see that form of note (*handing the same to the witness*)?

Yes; that is the ordinary form of note.

360. Do you see any objection to that form of note being uniformly required to constitute a contract in corn transactions?

I see this great objection to the course of business adopted on the Corn Exchange. For instance, this note is given by the factor to the buyer, but it is not the course of business, and it cannot be done, to make the buyer sign anything. The result is this, that the factor is bound, and the buyer is not. If the market goes up, the factor has to deliver; if it goes down, the buyer repudiates the bargain; and it is perfectly notorious that when there are sudden falls in the market, the buyers do repudiate the bargains to a great extent.

361. Is not the course of business in the corn trade this, that the factor holds a stall in the public corn market, at which stall he sells by sample to the purchaser?

Yes.

362. When he so sells, does not he make an entry in his own book?

The factors differ, perhaps, as to their books. They always give a note of that kind; but the entry with some of them would be a very loose entry; but some entry would be made, certainly.

363. Following my question strictly, and giving your answer according to the understood practice of the principal and most respectable factors in the corn trade, is not it the established usage to make a note in their book, similar to that which I have exhibited to you, and a counter note, rather more brief than that, in the margin of their book?

No doubt when it is framed in that way, that would be so.

364. The note thus filled up is delivered to the purchaser, is not it?

Yes.

365. Do you see any reason why, in so delivering up that note to the purchaser, they should not stamp in the bottom of that note "approved," and require the purchaser to sign it?

None, if you could get the purchasers to do it; but experience has shown that they will not. For a long series of years this course of business has been adopted on the Corn Exchange, and, practically, the seller is left at the mercy of the buyer.

366. Is not the reason why the purchaser would object, because he would lose the opportunity of subsequently repudiating the contract in consequence of a fall in the market?

Yes; because the present state of the law gives that species of advantage to the buyer; it enables the buyer dishonourably to throw up his contract if so disposed.

367. Would not the introduction of such a memorandum completely put an end to that unjust advantage given to the buyer, and of which he, practically, fraudulently avails himself?

Yes.

J. Hollams, Esq.
27th May 1856.

368. Would not, therefore, a little more stringency in writing give greater certainty to the contract, and be the means of closing the door upon the fraudulent and dishonest repudiation of a bargain?
Yes.

369. Then, upon what ground could the reduction to writing of a contract be objected to?
None, except that you cannot carry it out practically; the buyers will not do it; there is no convenience on the corn market for the purpose; it is crowded; it is comparatively a small place for the numbers who attend, and the factors stands are small places. Many factors make a great many contracts; and some of the millers and buyers are not used to writing, and it would take some time to read and perfect the contracts, and would be a very great impediment to business.

370. Is your only objection to the proposed plan of reducing these corn notes to a written contract, that the buyers would repudiate and refuse to sign them, being unwilling to surrender the means of dishonestly evading their contracts?
I have no objection whatever to the contracts being in writing; I should very much prefer it; but I object rather to the present state of the law, which leaves one party bound and the other not, although there is a legal contract. In those particular cases the contract is in writing; it is accepted by the buyer; he approves of it, and reads it, and puts it in his pocket, and carries it away; but he is not bound, though the seller is bound.

371. I understand it is urged in favour of the proposed alteration of the law, that it is necessary to let in verbal contracts for the purpose of preventing persons from dishonestly evading those contracts which they have verbally entered into; I wish to have your opinion upon that document, whether by a very slight and perfectly easy addition to it, written contracts might not be introduced, which would have the effect of most completely shutting out those fraudulent repudiations of contracts which it is the object and effect of the proposed clause to shut out?
I think that it would be desirable if you could induce parties to sign written contracts; but I know of no power that can compel them to do it, as the practice has shown that they will not do so.

372. You think that written contracts would be desirable, if practicable?
In most cases of importance or complication I think all prudent men would state their transactions in writing; it is certainly an advantage to do so; but I submit that there is no reason why, if parties have made a bargain which is clearly proved, they should not be bound by it, because the signature of one may be wanting.

373. I understand you to state distinctly, that you think that written contracts would be desirable, if practicable?
In most cases I think so.

374. Your only objection to the present state of the law is with regard to the impracticability?
The present law does not require written contracts; it requires some evidence in writing of a contract.

375. I apprehend you admit that the present law leans more strongly and gives more force to written contracts than the proposed state of the law would do?
I think that the present law leads to litigation and dispute; to a certain extent it does, certainly.

376. Are you aware, in the course of your professional experience in the City of London, of any public act of complaint or remonstrance against the existing state of the law on account of its great inconvenience and injustice?
No.

377. You are not aware of any class of tradesmen having either petitioned the Legislature, memorialized the Board of Trade, or by any other public act exhibited

exhibited their disapproval of the clause, and their strong objection to the law, and the inconvenience arising out of it?

Not any combined act; but it is exceedingly common to hear private complaints; and I think that very few people understand the question; the merchants of London do not understand the Statute of Frauds.

378. Do you apply that also to the principal solicitors of the City of London, under whose advice the merchants of London act?

Certainly not.

379. You have not read the evidence given before this Committee at its last meeting, in which two of the leading solicitors of the City of London distinctly confirmed the views which the merchants take?

I have not.

380. Have you ever had occasion to advise any of your clients, in consideration of the great practical evils and the dishonest results of the present state of the law, that they should either take public steps to apply to the Legislature to correct it, or more effectual means to introduce written contracts into their course of business?

It is a very common observation for me to make to clients when they blame the law, that they should take means to amend it.

381. I refer to any specific distinct act or formal recommendation, that they should take important steps to effect a correction of the act by application to the Legislature or the Government, or to modify its supposed evil operation by altering their course of practice under it?

Beyond the general complaint that they do not interest themselves enough in those questions which affect them, I have not.

382. *Chairman.*] You have spoken of the sales of floating cargoes, and have now been speaking of sales in the corn trade; are you familiar with any other particular branch of trade?

My experience is not at all limited to one description of trade, or one species of article.

383. You said that you thought the existence of this clause of the Statute of Frauds led to litigation; will you explain any case, or class of cases, in which that has been the result?

Yes; the first class of cases in which litigation arises is where there is a variance between the bought and sold notes when a contract has been made by a broker; then comes a question of law whether the variance is a material variance or not; that, I apprehend, is a question which it is extremely difficult to decide. Your Lordship is aware that the law books are full of cases, and I think I may say conflicting cases, upon that point. I happened to be concerned in one of the last cases before the Court of Queen's Bench; the learned Judges differed in opinion upon the subject; three of the Judges were of opinion that the variance was material; Mr. Justice Erle was of opinion that it was not.

384. Lord *Overstone.*] I presume, in all cases of contracts, the danger arising out of them must arise either from honest ambiguity as to the terms of the contract, or from a dishonest desire to repudiate it?

I think it would be a convenient answer to your Lordship's question to mention the circumstances of the case to which I have just referred. That was a case in which a house at Glasgow had sold a gentleman in London 500 tons of Scotch pig-iron. The broker sent a sold note to the buyer, describing it as 500 tons of Scotch pig-iron; but a mistake arose in sending the sold note to the seller; he described it as "Dunlop, Wilson & Company's iron;" they are well-known Scotch makers. The transaction was one entered into as a speculation; it was wholly immaterial to the buyer whether it was Dunlop's or any other Scotch iron. Upon that the Judges differed in opinion, three holding that it was material, and one holding that it was not. There was no doubt what the parties meant there.

385. In what way do you consider that that case illustrates the question at issue between verbal contracts and written contracts?

The necessity for having writing in that case produced manifest injustice.

J. Hollams, Esq.
27th May 1856.

There was no dispute whatever as to the terms of the bargain between the parties, but there was a technical difficulty in showing that that bargain was evidenced by writing.

386. Was not the difficulty in that case a difficulty created by the legal interpretation of the terms of the contract?

No, there was no difficulty as to the legal interpretation of the terms of the contract. The question rather was, which was the contract? There was no signed entry in the broker's book; if the broker had signed the entry in his book, although it had not been seen by either of the parties, the Judges all held that it would be sufficient; but the broker neglected to sign the entry.

387. As I understand your statement, the contract on one side was for Scotch iron, and the contract on the other side was for Dunlop's iron; and the result was, that the legal interpretation of that contract was to render the transaction invalid, on account of the ambiguity of the terms?

Yes.

388. Do you not think that the reduction of the terms of a bargain to writing is, as a general principle, calculated to diminish the chances of ambiguity rather than to increase them?

In many cases.

389. In the great majority of cases what is your opinion?

I should say that it was so in the great majority of cases.

390. How does the case to which you now allude illustrate the superiority of verbal contracts over written contracts?

Because it shows that the present state of the law leads to litigation and injustice.

391. Does not it show that the present state of the law leads to litigation, solely because it enables the Courts of Law clearly to see what are the terms of the transaction, and they find those terms to be ambiguous, and they therefore set aside the transaction; and is not that a legitimate result, and one which is conducive to public justice?

I think not. Taking that very case, Lord Campbell's judgment commenced by stating that he very much regretted being compelled to give judgment against the manifest justice of the case, but that he was obliged to do so, and that this technical point must prevail.

392. How do you think that that injustice would be obviated by resting upon a verbal contract; could it have been by any other means than this, that the verbal contract would have suppressed that discrepancy?

There was no real dispute as to what the bargain was in that case; both parties meant the same thing, and no one suggested that the difference was material, in fact.

393. They both meant the same thing according to your conception, but not according to the interpretation of the law; am I right in so understanding it?

They certainly, in fact, meant the same thing, and there was a correspondence to show that they meant the same thing.

394. *Lord Privy Seal.*] That difficulty would not have arisen if it had rested simply upon parol evidence, without any written evidence?

If the true bargain had been allowed to be shown, there would have been no difficulty at all in doing justice with the aid of those notes.

395. If the written notes had been allowed to be produced merely in illustration of the contract, that discrepancy would not have been fatal to the engagement between the parties?

No; no dispute whatever arose.

396. You consider that increased litigation arises from the necessity of putting every thing down on paper, that it allows of a greater introduction of mere technical differences, such as would not appear if parol evidence were sufficient to establish a transaction?

It creates those fine-drawn distinctions, as to what is a sufficient note of the bargain to satisfy the Statute of Frauds.

397. Lord *Overstone.*] Was not the real difference this, that one party acknowledged that he had bought Scotch iron, and the other party acknowledged that he had sold Dunlop's iron; and when that case was submitted to the law courts, they determined that that was an ambiguous contract, and therefore void; and would not that decision have been equally the same, if the same facts had been proved under a verbal contract, as under a written contract?

No, I think not.

398. Lord *Stanley* of Alderley.] Would it not have admitted other evidence which might have elucidated the matter.

Yes.

399. *Chairman.*] If parol evidence had been admitted in proof of the contract, there could not have been that discrepancy; that only arose in this way, that the common agent wrote it down in different words in the one note from those in which he wrote in the other?

Yes; the contract, strictly so called, was proved without any dispute by either party. No question was raised at the trial as to what the parties intended. Mr. Justice Erle was of opinion that that was enough for us; but the question arose whether there was a sufficient note in writing of that contract, signed by the party, to be charged.

400. Lord *Ardrossan.*] Have you any other cases of the same sort which you can state to the Committee?

Yes; I had a case which occurred a few months back. Some clients of mine sold a quantity of linseed cakes to arrive from New York at London. The destination of the ship was altered afterwards, and she sailed to Liverpool; the parties verbally agreed that there should be an allowance of 130 *l.* in consequence of the cakes not coming to London, but going to Liverpool. My clients, the sellers, wrote confirming that; but there was an omission to get an exact confirmation from the buyers. When the cakes arrived, the price was down, and they repudiated the bargain. There, I apprehend, manifest injustice was done by reason of the existence of the statute; the bargain was complete in itself. There was there an original contract in writing for the cakes; and there was this bargain as to the destination of the ship being altered to Liverpool instead of London.

401. *Chairman.*] The original contract was lawfully put an end to, and the substituted contract was not a contract in writing?

Yes; though in common parlance it would be called a mere alteration of the contract.

402. Lord *Overstone.*] You were the solicitor to one of the parties?

Yes.

403. Who were the solicitors to the other parties?

A firm at Norwich.

404. *Chairman.*] You were the solicitor for the losing party?

Yes; my firm brought the action; there were some letters, and there was a question whether they sufficiently recognized the altered bargain. We were advised by counsel that the recognition was not sufficient, and we did not proceed with the action.

405. *Lord Privy Seal.*] It seems that, practically, commerce will not uniformly conform itself to the necessity of a written engagement at every step, and that the consequence of any failure in any one step is to vitiate the whole of the transaction, and to shut out all evidence but this?

Yes; unless you can show that you have technically got the note signed by the party you seek to charge, it is hopeless to endeavour to enforce the contract, though admitted by him to be correct. Clients often consult me upon some dispute as to a contract; I usually ask, in the first instance, to see the contract; I am told that there is none, or nothing signed by the other party. I say, "It is no use going into the matter—the party is not liable." Then they say, "I know that he is an honourable man; I am sure he will not dispute that he bought the goods." I am obliged to say, "It is hopeless; we cannot do anything. The law says he is not liable; and it is of no use going into Court." It has often

J. Hollams, Esq.

27th May 1856.

often been proposed to me to call him as a witness. It is said, "I am sure he will admit it." I say, "It is true he may do so; but the law says that he is not liable to pay."

406. Does not your connection with the corn trade go to prove this, that the requirements of commerce refuse to be fettered by those engagements?
Yes, certainly.

407. Therefore the result is, that a number of commercial transactions, being of necessity not carried on according to their requirements, are left entirely as debts of honour, and have no protection of law at all?
Yes; I think all attempts to force merchants to be cautious must fail. Cautious men, in important transactions, will always, for their own protection, put the bargain into writing; but it is practically, in most cases, so inconvenient to put ordinary simple transactions into writing, that it will not be done. I think that there is a great distinction between floating cargoes and cases of that kind, and simple sales of goods on the spot. Where cargoes are sold by the importers before they arrive, it is frequently necessary to have complicated stipulations; those contracts are always in writing, and always will be in writing; but they are wholly different from the ordinary transactions on the corn market and in an auction room.

408. Lord *Overstone.*] I asked you whether, with regard to contracts, the two dangers which beset them are not, first, the danger of honest ambiguity, as to the meaning and purport of the contract, between the contracting parties; and, secondly, the danger of fraudulent evasion?
As to the first, I think the present law does not prevent it.

409. Are they not the two dangers to which contracts may be exposed?
Undoubtedly contracts may be, and are, exposed to those dangers.

410. Do you not think that written contracts will give the greatest security against honest ambiguities between the contracting parties, and be most calculated to prevent mutual misunderstandings, and to secure certainty as to what each party really means?
If a written contract is carefully prepared and signed by both parties, it is the better course of business; but practically, you cannot get men to be so cautious and careful.

411. With regard to the second danger, namely, that of the fraudulent evasion of a moral engagement entered into; if a party is so disposed to evade dishonestly his engagement, if you hold him to that engagement, through a mere verbal statement of its nature, will he not have many other resources upon which he can fall back, as to the quality of the article, and various other means of throwing ambiguity around the transaction, and evading it?
Of course any man may try to evade, but the law will compel him to keep the bargain, and will give a remedy to the injured party.

412. Will you, by giving legal validity to mere verbal contracts, accomplish the supposed end of preventing the dishonest evasion of a moral engagement?
To a great extent, I think you will.

413. Will not a party who is disposed to violate all moral dealings, and to avail himself of technical opportunities to evade a real moral and binding engagement, still have abundant sources through which he can raise questions more numerous, more difficult of solution, and far greater in their importance than the questions that now arise?
I think not; I do not anticipate any such evil. Your Lordship is aware that there are many contracts of great importance now which need not be in writing.

414. *Chairman.*] You were giving some instances of litigation which had occurred in your own practice; have you any other cases that you can state to the Committee?
Yes; I will mention another case. I have only selected from memory a few cases which have occurred in my own practice within the last few months: a client of mine sold, I think, 200 tons of raisins, then expected to arrive; he received the ordinary sold note from the brokers. My client was the seller; but

but it appeared upon investigating the matter, that the cargo had been bought by two different houses; one house had bought 100 tons, and the other another 100; consequently there was no valid contract to satisfy the Statute of Frauds; and the consequence was, that no action could be brought, and my client was obliged to put up with his loss. There the contract was in writing; but there were three pieces of paper. My client was the seller of 200 tons; one buyer had a bought note for 100, and the other buyer also for 100 tons, all agreeing as to the terms; but you could not make a complete written contract, because the bought and sold notes did not agree as to the quantity.

415. Lord *Overstone.*] Suppose you held a bill of exchange drawn upon a party, and received by you in payment of a debt, and held at the same time a letter from that party distinctly specifying that bill of exchange, and stating that he accepted it, and when it was due he would take care that it should be duly paid by his banker, and when you present that bill the banker refuses it, and it is treated by the law as an unaccepted bill, should you consider that that is unreasonable and unjust?

I think that there is a great distinction between bills of exchange and transactions of the kind to which we are referring. It is well understood by merchants, that they accept bills upon the face of the written paper.

416. Is that the invariable usage?

I apprehend so.

417. Have you never heard of parties being written to, requesting them to intimate their acceptance by letter?

I think I recollect two questions; and I can only call to mind two which have arisen within my practice as to verbal acceptances of foreign bills.

418. I am speaking of written acceptances by letter, but not upon the document; have you never heard of bills arriving in this country, drawn at out-of-the-way places, upon unknown persons, and the party writing to the acceptor to request an intimation of his acceptance in the case of either foreign or inland bills; I am not speaking of the mere legal obligation, but are there not many cases of trusting to the moral effect?

I do not know of any such case with reference to any litigation upon it; I may have heard of such cases.

419. You began your preceding answer by stating that it was the universal practice to have the acceptance upon the bill itself; do you think that you are correct in stating that that is the universal practice?

Perhaps I was not correct in saying that it was universal, but it is almost universal, I should say.

420. The object of my question was to ascertain whether all the objections you have stated to the non-enforcement of a verbal contract would not exist in still greater force against the non-enforcement of an acceptance of a bill of exchange intimated in writing, but not upon the bill itself?

Undoubtedly you may suppose cases of that kind, in which an amount of injustice would be done, and real injustice; where a man has undertaken to accept the bill, perhaps he ought to be liable; but I should hesitate before I altered a law which works well as to the acceptance of bills of exchange.

421. Are you aware that this Act proposes to alter the law, for the purpose of rendering all such acceptances invalid, and at the same time to alter the law as regards contracts in the opposite direction, by rendering verbal contracts binding?

The only difference that this Act proposes to make, is to assimilate foreign bills to inland bills. It is somewhat absurd to have one law when a bill is drawn at Boulogne, and another when a bill is drawn at Dover.

422. Lord *Ardrossan.*] Am I right in understanding you to say, that if in all contracts a merchant could have access to his solicitor, you then would rather approve of written contracts being necessary in all cases; but as in the greater number of cases merchants cannot have an opportunity of having recourse to their solicitors, then you think that verbal evidence is necessary in a great many cases?

J. Hollams, Esq.
27th May 1856.

I think that few would seriously contend that you are to have a solicitor to prepare ordinary mercantile contracts; but undoubtedly many of them require considerable caution and care, and there are many terms which, if the contract is reduced into writing, it is necessary to state, which in speaking verbally it is not necessary to refer to, but which nevertheless form part of the verbal contract and bargain. For instance, the time of payment; parties do not say ordinarily this is to be two months prompt, but they thoroughly understand that that is so, from their previous dealings or otherwise; and precisely so with reference to a contract made through a broker, the authority given to the broker is verbal; you say "sell" or "buy;" the broker upon that acts, and gives a written contract, with many stipulations in it, which were all implied in the order given to him, though not specified.

423. You think that if you force a merchant in all transactions to write down the contract, you would necessarily arrive at very great ambiguity from the want of knowledge of the technical law by the merchant?

Not so much by their want of knowledge of the law, but from the careless way in which merchants will do their business; you cannot, in the hurry of business, make them sit down carefully and study, and see that they put their terms accurately down into writing.

424. In fact, it would very much impede business if that were done?

Extremely so; it would be utterly impossible to carry on business in many trades.

425. Lord *Overstone.*] You are aware that by the law as it now stands it will not become imperative upon parties to have written contracts; but written contracts alone will be capable of being enforced by law?

Precisely so; but I think the proposed change has been very much misunderstood: it has been seriously said, and I believe understood, by a great many persons in the City, that it is proposed to abolish written contracts.

426. *Chairman.*] Have you heard an apprehension in the City that the proposed alteration in the law would subject persons inconveniently to have fictitious contracts palmed upon them?

A petition has been signed in the City; it was signed by a great many merely because it was headed very respectably, and because it was accompanied by this statement: "You are to sign against the abolition of written contracts." I have spoken to a great many who signed that petition, who have told me since that they did not understand it.

427. Lord *Overstone.*] Can you enumerate those parties?

I can enumerate some of them.

428. Did Messrs. Cook, Sons and Company so state?

No.

429. Did Messrs. Pawson and Company so state?

No; those are gentlemen in the Manchester warehousemen trade. I really should be sorry to pledge myself to details, because these conversations have been quite casual.

430. Lord *Stanley* of Alderley.] Have you any other cases which you can state to the Committee?

I could mention many cases. The Committee may remember that there was great excitement in the sugar market about six months ago, and a very sudden rise in sugar; and that had the effect of bringing a great many of what are called outside men, that is, speculators not ordinarily in the trade, into the market, and produced a great many questions. In several cases I found that the contracts could not be enforced. Those gentlemen who found that they had made a loss, instead of a profit, were not anxious to take the goods, and in consequence of the defects in the contracts they escaped. The most common difficulty arose from there having been several buyers to one seller. A man had authorized the broker to sell 100 tons of sugar, and he sold 50 to one, 20 to another, and 30 to another; none of those contracts could be legally enforced, and I am convinced that considerable injustice was done in consequence. There was also a very recent case of a cargo of Seville oranges; the same difficulty arose

J. Hollams, Esq.
27th May 1856.

arose there. The contract was originally in writing; but the parties changed the description of oranges. It was said, "Do you object to have some of one description instead of another?" The reply was, "It makes no difference;" and such a cargo was shipped; but the contract, as altered, was not binding.

431. Lord *Overstone.*] In a case of that sort, would not the admission of a contract by parol evidence open the door to litigation and dispute as to what was really meant, and would there not be a great possibility of saddling upon a party a contract in a form in which he never intended to make it?

No; in every case that I have quoted there has been no dispute at all. I may be permitted to mention another case, tried and decided before the Courts, namely, the case of Hunt and Hecht, in which I was concerned for the defendants. That was a case in which the proposed buyer bought a cargo of bones: he afterwards wrote to the seller, desiring him to deliver them at a given wharf, and enclosed in the letter the ordinary receiving order to the wharfinger, instructing him to receive them on his account; they were sent to the wharf; they were there for two days: the buyer then rejected them, I am bound to say, wrongly, because the jury found against him upon the facts, not at all turning upon the question of what the contract was; but the Judges held that he was not bound to take the goods, because there was not a written contract, and there had been no acceptance: that case is an illustration of the questions which arise as to the acceptance which is sufficient to satisfy the Statute.

The Witness is directed to withdraw.

G. Moffatt, Esq., M. P.

GEORGE MOFFATT, Esquire, attending by permission of the House of Commons, is called in, and examined as follows:

432. *Chairman.*] YOU are a Member of the other House of Parliament?

I am.

433. You are largely engaged in the tea trade?

Yes; I am extensively engaged in the internal commerce of the country in tea and coffee, and am prepared to speak to one or two other articles.

434. Is your business in the City of London?

In the City of London, and also in the Port of Liverpool.

435. You are aware that the Committee are discussing the subject of the 17th section of the Statute of Frauds, requiring a contract to be in writing, or some note or memorandum signed by the party on part deliverance or part acceptance; will you state, first of all, how far that clause is or is not adhered to in your dealings?

I may be permitted to remark, that, looking over the evidence given a few days since, I observe that it is principally given by one particular class of mercantile men, I mean the importers of goods; and that their evidence goes mainly to contracts made by them, and generally through brokers. But your Lordships have as yet received no evidence of a class of traders, the number of whose contracts is five hundred fold those of the merchants by brokers, I mean the great dealers in the ports of London and Liverpool, in Manchester and various great towns, who sell goods at their own counting-houses and warehouses, or who send their representatives throughout the United Kingdom to effect sales. The practice in most trades, I think I may say the almost invariable practice, is to instruct their representatives, when they sell goods, to give a written contract. But in a great many instances, the buyers will not take a written contract. I may illustrate that in reference to the tea trade, upon which I can speak with an immediate knowledge. In my firm, the instructions are peremptory upon our representatives to give written contracts. They have complained that, frequently, it obstructs business, and that other houses do not give them; I believe the rule of many vendors of tea from London is not to give written contracts. We have further given instructions to our representatives to demand from the buyers of goods, that they should give also

G. Moffatt, Esq., M. P.

27th May 1856.

a contract, or sign the counterpart of the contract, or put their initials, to certify that they have made that contract; but this we have not been able to establish. The buyer says, "If you do not like to make this contract with me upon the accustomed usage, other houses will," and so declines doing business. I believe such to be the universal custom in regard to contracts in the tea trade, the sugar trade, and the coffee trade, and a great variety of other trades. I believe I may state it to be the general practice that, in some cases, contracts are given, but in a great many instances they are not given; and in no case, as a rule, are contracts ever obtained from the buyer of the goods. I may also state to your Lordships, that there is a vast quantity of produce in the City of London sold without any contract passing between the buyer and the seller. I allude now to the sugar and coffee trades. I have found, by reference to the catalogues in the coffee trade, that no less than 24,000 lots, making 24,000 separate contracts, were sold in the last year, in which no writing whatever passed between the buyer and the seller until the day of the prompt, when the invoice of the goods is sent, that is, one month after the contract is made. It is the same in reference to sugar, in which I find, in the last year, the number of contracts so made, is estimated at upwards of 70,000 separate contracts, in which no writing whatever passed till two months after the contract, unless the buyer required to clear the sugar before. I will now state to the Committee the present operation of the Statute of Frauds on trade, which I apprehend to be the question involved in the inquiry. It operates, so far as I know, not as a protection to the fair and honest dealer, but as trade is conducted, it affords facilities to those who seek to evade contracts and act dishonestly. I am confirmed in this opinion by my own experience, and by frequent conversations for the last eight or ten years with various solicitors. The majority of them who have to deal with the trade of the country express great regret at the existence of that statute. I may state, as coming within my own knowledge, a case (brought before me for advice) in the sugar market, of contracts made a few months since; the value of the sugar has fallen; the buyer does not pretend to say that he has not bought the sugar, but he declines fulfilling the contracts, there being a loss of 600*l.* or 700*l.* upon them. This morning I saw the solicitor who has the conduct of that case; he says, "I have the case clear that the sugars were sold, but I am sure my clients have no remedy in a law court, because they cannot get this man to give a single word in writing that he has bought those sugars. I may state another case which occurred a few months since with regard to my own house at Liverpool; they sold, and shipped teas to Londonderry; the goods were not insured; the party was not in the habit of employing the house at Liverpool to insure his goods; an invoice was sent, and written "not insured." The steamer was wrecked, and the goods were lost. When they became due, the buyer said, "I do not mean to pay for those goods;" of course some correspondence followed, which resulted in his solicitor writing, "I recommend my client to shelter himself under the Statute of Frauds." We placed the affair in the hands of our solicitors at Liverpool, stating our perfect indifference about losing the money, or ten times the sum, if we could successfully assert the principle of punishing a man acting dishonestly. Our solicitors advised us not to proceed in the matter; that the Statute of Frauds was a thing so perfectly covering and protecting the dishonest buyer, that we had better let it alone. We acted upon that advice.

436. Lord *Stanley* of Alderley.] If you could have adduced other evidence, could you have established the contract in that case?

Most assuredly we could have proved the contract; but our solicitors advised us, "When you have done so, you have not complied with the Statute of Frauds in getting from him a written agreement to the contract."

437. Lord *Overstone.*] How was the sale made to the party at Londonderry?

Through the representative of the house in Liverpool.

438. A party at Liverpool made a sale to a house at Londonderry?

Our agent in Londonderry made a sale to an individual in Londonderry.

439. Would there have been any difficulty or impediment to business in his having

having made that transaction through a written form, if you had thought that a written contract had been necessary?

The contract in this special case was not done as we ordinarily instruct the representatives of our firm to act. He had merely written the bargain on the back of a letter, and showed it to the buyer, and said, "That is right," which the buyer affirmed, and the agent put the letter in his pocket: he was going off in a hurry; he reported the contract to the house.

440. Do you think that, for the security and safety and respectability of transactions of business, it is really desirable that contracts of an important character should be left to rest upon such evidence as that which you describe; do you not yourself think that something more formal and more distinct, to make contracts valid, would add to the respectability, to the safety and certainty of transactions in trade?

If we could make all contracts under similar circumstances of abundance of time, convenience of situation, and every other advantage, such as might be given to contracts made in this room, it might be good. I should prefer, and I always do prefer, written contracts; but I think it is prejudicial to the trade of this country that the law defines that no contract shall be binding in regard to the purchase and sale of goods unless made in writing.

441. You are aware that the question now at issue is not an attempt to introduce into those contracts a new law, but an effort to retain the law as it now exists?

I am. Another case of the operation of the Statute of Frauds occurred with my firm about 12 or 14 years since; that was in London; and that contract was made through a broker; it was for a large parcel of tea; the tea was sold from my firm to another firm in the trade. The broker passed the notes, as he thought, regularly and in order. The tea was sold at the usual conditions of the trade, at three months prompt. On my contract, as the seller, he followed the usual course of putting the words "usual conditions;" it is always understood what those conditions are; but in the buyer's contract, being anxious to be very precise, he put "prompt" such a day, viz., the day on which it would square with the usual terms. The buyer disputed the contract. The case went to a jury; it was tried before my Lord Denman; the issue was raised whether this variation in the contract between the "usual conditions," which was proved before the jury to amount to the same date as that fixed in the buyer's contract, was a fatal variation, and also as to the fact whether the contract had been made. The jury, without leaving the box, found that it was not a fatal variation, that the notes carried the same meaning, and that a contract had been made. The case was taken before the Judges in banco; it was there discussed. The Judges found that it was a fatal variation under the Statute of Frauds; and consequently they ordered a new trial, or there was a non-suit. I forget which; that involved a question of between 1,500 *l.* and 2,000 *l.*, the difference of the verdict, in which I was a loser. These are my experiences as to the operation of this clause of the Statute of Frauds, and I speak with considerable confidence in reference to the feeling of the wholesale traders as to the injurious operations of this clause as it now stands.

442. In the case which you have stated, were not the facts these: that A., the seller, contended that he sold upon certain conditions, and sent in a note to that effect. B., the buyer, contended, and sent a counter note, to the effect that he bought upon other conditions; then the seller considered that the difference between the conditions was immaterial; but the Courts of Law held that the difference between the conditions was material?

The facts were these: a special jury, composed of mercantile men of the City of London considered the facts to have been proved, and they considered, as mercantile men, that the variation in phraseology was immaterial; but the Judges, acting, of course, upon the *literaliter* of the 17th section of the Statute of Frauds, did consider that it was material.

443. Was not the substantial fact of that transaction this, that the seller contended that he sold something by prompt payment, and the buyer contended that he bought upon three months' credit; and upon that ambiguous character of the transaction the case came to an issue. A Court of Law decided

G. Moffatt, Esq., M.P.

27th May 1856.

that it was an ambiguous contract, and therefore invalid; and would not the same ambiguity have arisen upon any verbal statement, as upon a written contract?

Unfortunately the ambiguity is entirely in your Lordship's mind, and not in my statement, or in the facts given to the jury. It was distinctly proved in that trial, that the "usual terms" were three months prompt. Upon the one contract it was distinctly proved that, say the 19th of May did mean the same date as the words "usual terms," and there was no ambiguity whatever in the case.

444. Were the buyer and seller in that case perfectly agreed as to the meaning of the terms of the contract; was not it a case of litigation as to the meaning of those terms, one party interpreting them to mean prompt payment, and the other party interpreting them to mean payment upon credit?

There was no dispute with reference to the meaning of the terms between the buyer and the seller, for the buyer did not know of that difference in the contracts till it was produced in Court, when it was discovered by Sir Fitzroy Kelly, who held up his hand, and said, "There is a fatal variation, my Lord," when he saw the difference between the two contracts.

445. *Chairman.*] Those notes are not accurately represented as being the contract; they are the memoranda that the common agent of both parties makes afterwards, one of which he delivers to the one party, and one to the other?

Yes, precisely.

446. In most of those cases, I believe the question is not the question of what was the contract between the parties, but in what form the broker has written it down for the two parties?

That, I believe, is very often the case.

447. With regard to the expediency of having written contracts, I suppose that if you order your coat at your tailor's, you are more certain to have it quite accurate if both parties reduce the agreement into writing, as to what cloth it is to be made of, and what price is to be paid, but the multiplicity of transactions makes it impossible to carry that out generally?

Yes, practically impossible. In reference to the case which I have named to the Committee, having occurred at Londonderry, the solicitors placed before me some records of the trials in Ireland; and I noticed in one Term, I think, three or four cases wherein the Statute of Frauds was pleaded, and according to the evidence, so far as I could judge, they were cases going pretty much upon all fours with my own at Londonderry, in which the buyer evaded a contract simply because the law allowed him to do so, and it was a pecuniary advantage to do it. I think the best course would be simply to repeal the 17th section of the 29th of Charles the Second, and let commerce take care of itself; enact nothing whatever in its stead; and this, I think, may be done with the greatest safety at the present time. When this Act was passed the law of evidence was entirely different from what it is now. Now, in case a contract is attempted to be foisted upon me, I can go into a Court, and give evidence upon my own case. Till within a few years it was not in the power of any party to do that; and also, if you are the defendant in the cause, you can call the plaintiff, and consequently, if a case of dispute arise, you have a greater likelihood of getting at the facts and justice of the case by leaving the whole question to the decision of a jury, than you would have by clauses inserted in any Act of Parliament providing what the contract should be. There can be no doubt that it would be a great advantage always to have written contracts; they are the simplest and the best evidence, and it would still be desirable for every house to have written contracts, parol testimony being admitted. I believe the alteration of this Statute, by striking out the 17th clause, is the best thing that can be done; and so far as I am acquainted with commerce, it is the only thing that I should be disposed to advocate or recommend in reference to the alteration of our Law of Contracts.

448. Lord *Overstone.*] You objected to the evidence which has been already given before this Committee, on the ground that the parties called were exclusively of one class, namely, large merchants, dealing through the agency of brokers; and you further added, that there was an immensely greater number of transactions carried on by what you call the great dealers selling goods either

at

at their own counters, or through agents travelling through the country; have I correctly represented your statement?

Yes, I think so.

449. Have you looked over the signatures to the petition presented against this Bill?

No, I have not.

450. Will you tell me whether there are not the signatures to that petition of names of a great number of houses answering to your description of those great dealers (*handing the petition to the witness*)?

There appear to be, undoubtedly; but I may explain to the Committee that the short statement given was, this petition is to prevent the abolishing of written contracts; and when a petition is brought for signature the principal looks to see who has signed, and if there are a great number of respectable names, is content to indorse Mr. So-and-so, or Messrs. So-and-so.

451. With respect to three or four of those houses, do you think that they are houses which are likely to sign an important petition of this character without understanding it, or are they likely to be persons to fall into so shallow an ambiguity as that which you have stated; do you think Messrs. Cook and Sons, Messrs. Pawson and Company, Messrs. Ellis, Everington and Company, Messrs. Pickfords, or Messrs. Finnis and Company, of which the alderman is at the head, were likely to sign this petition upon a total misconception of the purposes of the petition, so as to be misled by the fallacy to which you allude?

There can be no question of the high respectability of those houses.

452. Nor of their intelligence?

So far as I know; I know that several of them have achieved a high position in the City of London, and I do not doubt their intelligence, but I am not at all prepared to say whether they had read the petition or not.

453. You have said that the provisions of the Statute of Frauds are, in your judgment, beneficial only to those who seek to evade their just contracts?

So far as I have seen its practical operation, that is the result.

454. Have you looked over the names of the houses signing this petition, and do you think that those houses, speaking of their general character as a body, are persons at all likely in any way whatever to uphold the Statute of Frauds because it would be beneficial to them in seeking to evade their contract?

May I suggest to the Committee as quite possible that the majority of the parties signing this petition are not aware of what the provisions of the Statute of Frauds are.

455. Whatever may be the inconveniences or evils of the existing state of the law, have they been such as to have induced you, or any important class in the City of London, to take any formal or official steps for the purpose of obtaining an alteration in the law by a petition to Parliament, or by memorializing the Board of Trade, or any other great combined acts?

Publicly I have not; but I have several times had consultations with my solicitor, with the view of introducing a Bill into the House of Commons to repeal that clause of the statute; but I have abandoned it by reason of the difficulties which I found in the way of any other than a lawyer successfully introducing a Bill touching legal technicalities into the House of Commons.

456. *Lord Privy Seal.*] Do you not think it desirable that there should be in every criminal case more witnesses as evidence, if they could be found?

Yes.

457. Do you therefore think it desirable that no crime should be punished in which such evidence cannot be produced?

Unquestionably not.

458. Do you not think that the argument in favour of the necessity of written contracts in every case as the only binding evidence is something of that nature?

Something of that nature. The analogy is not exactly on all fours. But I may state to the Committee, that the manner of making contracts, the terms

G. Moffatt, Esq., M.P.

27th May 1856.

in which they are made, the great variety of circumstances, and the differences of trade, all render it exceedingly inconvenient to attempt to lay down any precise rule which is to govern all trades in common, and still more inconvenient if you attempt to legislate for particular trades; consequently, my recommendation would be to leave trade unfettered in reference to contracts.

459. Lord *Stanley* of Alderley.] You have stated that, as far as your experience goes in the transaction of your business, in a great number of transactions you are unable to obtain written contracts, and consequently those transactions are upon honour, and may be repudiated; and you consider that state of the law very objectionable, and think it desirable to admit parol evidence, as well as the written contract?

Most unquestionably.

The Witness withdraws.

Ordered, That this Committee be adjourned to To-morrow, half-past Two o'clock.

Die Mercurii, 28° Maii 1856.

LORDS PRESENT:

Lord Privy Seal.	Lord Stanley of Alderley.
Earl Grey.	Lord Overstone.
Lord Wrottesley.	

THE LORD STANLEY OF ALDERLEY in the Chair.

Professor Leone Levi and James Marshall Brookes, Esquire, are called in, and examined.

Professor LEONE LEVI is examined as follows:

460. *Lord Privy Seal.*] YOU have been in communication with the Chamber of Commerce upon the subject of the proposed alteration of the law as to the Statute of Frauds, have you not?

I have.

461. Have you any information from them, or on their behalf, to communicate?

Not recently; I have not had time to communicate with them since the Committee was formed; but previously, during the discussion on the Mercantile Law Commission, I communicated with them on the subject, and had occasion to know their general opinions.

462. *Chairman.*] Those opinions are already in the Report of the Commission?

Yes. With regard to the general subject of inquiry, I may say that by the old Roman law, verbal evidence was universally admitted. Justinian was the first who put some limits to such evidence, but it was not till some centuries after his death that any specific exceptions were introduced. The Statute of Bologna of 1454 was the first statute on the subject; next, that of Milan, of 1498; and subsequently the Ordinance of Moulin, by l'Hopital, of 1556, which restricted the admission of verbal evidence in order to diminish perjury. The 54th Article of that Ordinance rendered it imperative for all contracts of an amount exceeding 100 francs to be in writing. The Ordinance of Colbert, of 1667, adopted the same regulation; but notwithstanding these, the mercantile Judges were under an express exception with reference to trade; they were authorized in all matters of trade to receive verbal evidence, and they were not bound by the Ordinance itself with respect to such questions.

463. Lord *Overstone.*] They were authorized, but not compelled, you mean?

Authorized, but not compelled.

464. They were authorized to receive it at their discretion?

Yes; the Code of Commerce authorizes the discretion of the Judges to receive verbal evidence in matters of trade: it is in the Seventh Title of the First Book of the Code. The means by which they are to receive evidence are by books of trade, by written agreements, by regular deed, or in any other manner; and the last by verbal evidence. The same law prevails in Holland. In the "Introduction to Dutch Jurisprudence," by Grotius, translated into English by Charles Herbert, a late edition of which appeared not long ago, it is

Professor Leone Levi.

28th May 1856.

expressly stated, "A purchase may be made either in writing or without writing. An agreement without writing can be entered into, not only between parties present, but also by letters, messengers or agents."*

465. Will you explain what is meant by "an agreement can be entered into?"

That it is valid; that it is legal; that it may be established by law, provided the evidence is of sufficient strength to make it clear. The same title of the French Code has, as a matter of course, been introduced wherever the French Code itself has been introduced. Therefore it is the law of most of the continental States at present; so that in that respect, the commercial relations of the continent of Europe are not trammelled, as I consider it, by any specific line of evidence.

466. *Lord Privy Seal.*] How is it in the great commercial towns of Europe, say Hamburgh?

I am not exactly aware of the law in Hamburgh; the laws of Hamburgh are not so clear. There are various scattered Ordinances; no Code properly so called. I have never been at Hamburgh, so that I am not aware of the practice there with reference to these matters, but there is no reason to suppose that it is different from the practice of Holland. I may say further, that in Sardinia, by the old Regia Legge,† as given in Azuni's Jurisprudenza Maritima, which is the Commercial Dictionary of an eminent Italian jurist, all contracts must be by public instrument; but there were excepted contracts of sale of goods and moveables.‡ The present code of the Sardinian States is founded on the French Code.

467. Appearing to recognize that the course of commerce often requires transactions to be concluded in a manner which precludes the possibility of appealing to a written instrument in every case, however desirable a written instrument may be in most cases?

Exactly; that is the point I believe to be drawn from the evidence of these Codes and Ordinances.

468. Lord *Overstone.*] Can you give any evidence as to the practical operation of that law at the great port of Sardinia, namely, Genoa?

I am not aware of it.

469. *Lord Privy Seal.*] But it prevails; it is in force there?

It prevails.

470. Lord *Overstone.*] Your knowledge only goes to the law?

Yes, as it stands.

471. You know nothing of the practical operation of the law?

I do not. With reference to the United States of America, the Statute of Frauds has been introduced there, and is now included in the Revised Statutes; each State has, however, a different edition of the Statute, so to say, a little improved in some of its terms; but still the substance of the Statutes is the same. In Louisiana there exists a code of laws founded on the French Code, and there the Statute of Frauds does not prevail.

472. The Statute of Frauds does not prevail in Louisiana; but is not that observation limited, according to your own statement in page 42 of the Second Report of the Mercantile Law Commission, to the sales of moveables?

Moveables and goods are the same thing—personal property.

473. Do moveables include merchandize in all its forms?

Certainly.

474. Can you state whether the Statute of Frauds is altogether inoperative in all the great transactions of a mercantile character in Louisiana?

That is my opinion.

475. Is that your knowledge?

I know it as a fact that the Statute of Frauds does not prevail in Louisiana.

476. It

* Grotius' Introduction to Jurisprudence; book III, c. xiv., s. xxvi. and xxvii., p. 341, 342.

† Regia Legge, lib. 5, tit. 22, cap. 4, s. 1.

‡ Ditto, s. 8.

Professor Leone Levi.

28th May 1856.

476. It is within your knowledge that the Statute of Frauds is not in operation, with regard to any purchase or sale, or contract referable to mercantile transactions, in Louisiana?

Yes. I may mention that Kent, who is a very eminent American jurist, who wrote a Commentary upon American law, perhaps the best extant, stated in his book, "It was said in the last century, at Westminster Hall, that the Statute of Frauds of 29 Charles 2, has not been explained at a less expense than 100,000 *l.* sterling: I should suppose, from the numerous questions and decisions which have since arisen upon it, that we might put down the sum at a million and upwards." That is in the last edition of Kent's Commentaries.

477. *Lord Privy Seal.*] Then Kent's opinion was hostile to the Statute of Frauds?

This quite proves it: it is in the form of a note in the last edition.

478. Have you the page?

It is the second volume, p. 661, 7th edition, just at the end of that volume: it is rather important. Another eminent English jurist, Smith, in his Lectures on the Law of Contracts, said, "The great Lord Nottingham used to say of it, 'Every line was worth a subsidy;' and it might now be said, with truth, that every line has *cost* a subsidy, for it is universally admitted that no enactment of any legislature ever became the subject of so much litigation." His is one of the best books we have.

479. A modern book?

A modern book; a new edition of it has come out lately. We have therefore two evidences of two very eminent jurists to the effect, that the Statute has been productive of very considerable litigation, and one has asserted that the decisions on the same cost about a million of money. With reference to the general working of the law, I have had occasion, as Professor of the Principles and Practice of Commerce at King's College, London, to lecture upon this very subject, and to search the cases having reference to it. I have also, in my late work on Commercial Law, alluded to the law and its working at some length, so that I have had occasion to ascertain the practical working of the same, and I can, without hesitation, say, that almost uniformly all the cases on the subject which have appeared before a Court of Law have tended rather to encourage, to support, and to protect fraud, instead of protecting individuals against fraud. The cases which have come before me, and which any other individual can ascertain, prove the fact that the Statute has uniformly been taken hold of by persons who wanted to escape the contract; and that persons who wanted to bring out cavils which no other reason whatever would support, have taken refuge under this statute; I am not aware of any single case where it has really been productive of good. The good may be negative, which is another question; but so far as it appears in the face of the numberless cases having reference to it in the books of law, from the enactment of the Statute down to this day, the cases have almost universally tended to favour fraud rather than to protect men against fraud.

480. Lord *Overstone.*] As a person, not only studying the principles of law, but also endeavouring to study the practice of the law, you must of course be well aware that it is the essential character of any good law that the good which it effects is latent; that the good consists in the evil, the occurrence of which it prevents?

Yes.

481. For instance, with respect to the law in question, if the law be in any degree operative, its supporters contend that its effect is to prevent false contracts from being imposed upon them, which would be imposed if the law did not exist; consequently the very existence of the law prevents the occurrence of those evils against which they contend that it is a protection; and the very efficiency of the law prevents those cases coming into Court which would show its efficiency?

That would be true if the evidence of those countries where the Statute of Frauds has never been introduced did show that there was so much fraud that something was really required to prevent it; but we have evidence quite to the contrary. In Scotland, where it has never been introduced, we have no reason to suppose (and I made inquiry but last Saturday of Mr. Dunlop, the Member

Professor Leone Levi.

28th May 1856.

for Greenock) that there is more fraud than there is in this country. We have no reason to suppose that in France there is so much fraud practised, because there is an exception in favour of mercantile contracts. We cannot instruct people by law; we cannot make them prudent, or cautious, or wise by law; and if they are imprudent, if they make contracts without proper caution, I am sure they will not be improved by the existence of the Statute of Frauds.

482. Suppose a law passed prohibiting a crime, or prohibiting a practice eminently inconvenient to the public interests, with the sole efficiency that no such crime or no such practice is ever resorted to in consequence of the law; would you infer from that law being apparently never brought into operation, so far as the proceedings of the Courts of Justice were concerned, that therefore the law was inefficient and useless?

No; but I would attach very little importance to the existence of the law; I would rather attribute any change or the non-occurrence of such a crime to the improvement in morals. The existence of the law does not improve the morals of the people; it may indeed prove a source of fear, but it will not correct individuals. And even if it did arrest great crimes, that would be no inference at all that any law can improve the morals.

483. I think you will perceive that you have not given an answer to my question. My question is directed to elicit an answer upon this principle, whether the efficiency of a law, consisting in its prevention of crimes, the non-existence of crimes in Courts of Justice under that law, is any evidence whatever of the deficient effectiveness of the law?

No.

484. *Chairman.*] Will you continue your observations?

I might perhaps mention another important view of the matter, and that is the effect of the law as it exists internationally. It is a rule of international law that a contract void by the law of one country is void anywhere else in consequence. Suppose a Frenchman were to make a contract in this country to-day, with full confidence in the individual with whom he dealt or treated, say, for 1,000 tons of rails, and in the evening he left and went back again to Paris: in the event of rails rising in price the next morning, if the Englishman wished to withdraw from the contract, he would be perfectly free to do so, being protected by the law in England; the Frenchman in Paris may to-morrow morning re-sell those 1,000 tons of rails, on the faith of the contract which he has made to-day on the London Exchange, and he may find afterwards that, by the technicality of the law of England, which does not prevail in France, he is precluded from enforcing that purchase.

485. But those observations equally apply to transactions between a merchant at Liverpool and a merchant at Glasgow?

Exactly.

486. Lord *Overstone.*] Why, in that case, do you assume that the agent of a Frenchman acting in England does not make the contract in a form valid, and according to English law?

Considering the present connection with France, and the facility of travelling, we may well suppose that the Frenchman himself comes for a day or two, and makes the contract, in total ignorance of the existence of the Statute of Frauds, which Englishmen themselves know little about; and the consequence will be, that on his return home he may think to have made a valid contract on the faith of a verbal agreement, which in France would be valid.

487. Do you think, as a jurist, that it is the duty of this country to make its laws conform to the laws of other countries, because parties coming from those other countries may enter into a contract in this country in ignorance or in neglect of the form of the law which this country maintains?

I believe that if the law cannot be considered as productive of good, and cannot be considered as required by the commercial world, and is an exception to the general law of nations, it is the duty, and the incumbent duty, I may say, of the country which has this exceptional law to consider its working, and more especially if it be found that it encourages fraud rather than protecting against it, to remove it at once.

Professor Leone Levi.

28th May 1856.

488. But my question is this, founded upon your previous argument, namely, whether you think, as a jurist, that it is the duty of this country to make its commercial laws conform to the commercial laws of other countries, say, for example, of France, because a Frenchman coming temporarily to this country may otherwise enter into a contract in this country not binding according to our laws?

Of course you cannot decide universally; you cannot adapt the law to every trifling circumstance; but when there are other reasons justifying such a course of conduct, when the evidences altogether combine in showing that this exceptional law can be taken advantage of to encourage fraud rather than otherwise, I think that that single circumstance is a very strong circumstance to justify such a change.

489. Why do you consider it the duty of this country to make its law in the case under supposition conform to the French law, rather than the duty of France to make its law conform to the English law?

First, because the French law is that which prevails throughout the Continent of Europe; whereas the English law is the exception: and, secondly, because it is the best.

490. Then your argument I understand to be this, that the English law ought to conform to the French law, and not the French law to conform to the English law, because in your judgment the French law is the better law of the two?

Certainly; first, because I consider it the best; and, secondly, because it is the widest spread.

491. You state that the French law is the widest spread; does not the English law exist throughout the whole of the United States, with the exception of Louisiana?

Yes.

492. Does not it exist throughout the whole of our colonial possessions?

Not universally. It does not prevail in the Bermuda Islands.

493. All but universally?

In most of them.

494. Do you not think that when we are speaking of universality with regard to mercantile transactions, the mercantile transactions of this country with all its Colonies, or nearly all its Colonies, and of the whole of the United States, with the exception of Louisiana, are far more wide, far more important, far more numerous, and far more complicated, than they are on the Continent of Europe?

So it may be, but that will not prove the case.

495. *Chairman.*] If you found that in one important portion of a country the usage and practice was contrary to what was the law of that country, and that the law of a neighbouring portion of the same country was agreeable to the practice in the former portion, and not according to the law as prevailing in the rest of the community, would you not think that it was very desirable to reconcile the laws and make them conformable in both cases?

Certainly; in this case we have the practice in Manchester contrary to the law—I do not say in Manchester only, but almost throughout the community; and I do not except London when I say that. We have the practice very extensively throughout the United Kingdom; that fact is on the side of the abolition of the law in question. We have then the law of Scotland decidedly, and without exception, in favour of the abolition. We have France, Belgium, and most of the neighbouring countries also, on the same side; and I believe under those circumstances that the law of a portion of this community should rather adapt itself to the law and the practice of all these countries than to turn the practice and the law of these countries to the specific law of this single portion.

496. Would not that be particularly true if the practice and usage of a great portion, even of that country where the law prevails, was at variance with the law upon the subject?

Of course it would.

Professor Leone Levi.

28th May 1856.

497. *Lord Privy Seal.*] You have referred, I think, to the question of the importance of assimilating the law between France and England as a duty; putting aside the question of duty, do you hold it to be expedient that, as far as possible, and more especially with a view to the increasing personal relations of the several countries now existing, the commercial laws should be assimilated?

Decidedly so.

498. That there should be a presumption in favour of assimilation, where there is no special ground shown for a difference?

Yes, for this very reason. Suppose the case which I stated (which is quite possible), of a Frenchman coming to this country, making such a contract, and on the faith of it, on his return to France, entering himself into certain engagements with reference to it: if he finds afterwards that the law of this country by certain technicalities actually prevented the fulfilment of the contract, and gave encouragement to the defaulter to withdraw from the engagement, he will say next, "I will not go again; I will rather be at home; and when rails are offered on sale in France, I will buy them here; it is of no use my going to England to take the risk, when I do not know their laws; I may perhaps make a mistake, or be deceived, and therefore I had rather not go."

499. In fact, you are of opinion that, although the expediency of assimilation is not an overruling consideration, it is in itself a consideration in favour of a change of the law as far as it goes?

Certainly.

500. Lord *Overstone.*] When you speak of the expediency of assimilating the commercial laws throughout the globe, do you not think that it is expedient in that case that the smaller body (by smaller, I mean as to extent and importance of commercial transactions) should conform to the law of the larger body, rather than the reverse?

No; I think that we should consider what is right and best.

501. We are speaking now of the expediency of assimilation, without assuming that one is more right than the other, *per se?*

In the abstract I would consider it so; but if it be considered that a very large portion of the community has a law which produces so much injury and so much expenditure, it is a perfectly reasonable inference that the larger should conform itself to the smaller, rather than that the smaller should conform itself to the larger.

502. You will perceive, of course, that that answer assumes the question at issue, namely, the superiority of one law over the other?

Yes.

503. We are endeavouring to test the validity of the argument which, without deciding the question as to the superiority of one law over the other, would hold that it is a duty, or that it is highly expedient that the different countries of the world should assimilate their commercial laws; I then wish to ascertain whether you do not, as a jurist upon commercial law, consider that the expedient course upon that supposition would be, that the countries whose transactions are smaller in amount and magnitude should conform to the law of those countries whose transactions are infinitely larger?

I need not say that such questions must be considered each individually; a very general assertion could not hold. In some points, the great extent of the transactions would be of course a considerable element; in others, the righteousness of the principle must come into play; and I consider that the expediency of assimilation should go hand in hand with the importance of the transaction at stake, with the rectitude of the principle at stake, and with the practice of the nations in respect to it.

504. *Lord Privy Seal.*] Do you not, as a jurist, consider that the presumption is in favour of the enforcement of any contract which really took place, and of which good evidence can be adduced; and that the restriction as to the kind of evidence which shall be admitted is one which requires very strong argument to defend it; so that the natural presumption is in favour of the admission of any contract which can be established by sufficient evidence, and that it is not likely that foreign nations shall assimilate their laws to ours by admitting a restriction of the necessity of which apparently there is no evidence?

I believe that. Your Lordship will have seen that, by the French law, as I stated

Professor Leone Levi.

28th May 1856.

I stated before, the Judge has it in his option to admit any kind of evidence, —to admit verbal evidence, if that evidence is sufficient. In the view of the French law, there is no reason why verbal evidence should be excluded. They admit the possibility of such evidence being valid and good, and, in consequence, they give authority to the Judge to receive it. If a person makes a contract verbally, there is no reason why the evidence of it should be excluded, because it is not written in a certain form and manner. The moral duties of the individuals ought, in a measure, to stand foremost, and then the legality of the course should be a subsequent consideration.

505. Lord *Overstone.*] Do I understand you correctly, that the law of France does not lay down that parol evidence shall in all cases be admissible to prove a contract, but that it shall be admitted at the discretion of the Judge, the Judge considering whether the particular case in question is of that nature to make parol evidence properly admissible?

Yes; the law is in this form; it is in a very short paragraph: "Evidence of purchase and sale shall be received by means of public deeds, books of traders," and one or two other modes; and, lastly, "by verbal evidence, at the discretion of the Judges."*

506. *Chairman.*] It admits any evidence, in fact?

Yes; that is the mode in which it is drawn up.

507. Lord *Overstone.*] I wish to understand this point quite clearly and distinctly, that there may be no misconception between us: am I correct in the understanding I now have, that the French law does not say that in all cases parol evidence of a contract shall be received *quantum valeat*, but that it may be admitted in certain cases, if the Judges deem those to be fit cases for that purpose; is it so, or is it different from that?

I would say yes to the question, except to the "certain cases," and "if they are fit for the purpose." The only thing which the law states is, that it is in the discretion of the Judges: it does not prescribe any certain line of cases, or certain specific cases; it only leaves it at the discretion of the Judges to receive such evidence.

508. *Lord Privy Seal.*] In fact, you have quoted the words of the law?

I have.

509. Lord *Overstone.*] My only object in these questions is to come to a precise and distinct understanding as to the French law. What I wish to ascertain is this: whether the French law goes any further than to this extent, that parol evidence of a contract shall be admitted if the Judges think that it is a case in which it is right to admit it, but that it is not admissible unless the Judges so decide with regard to the particular case that is before them?

Your Lordship's words are a little more extended than the words of the Code. The words of the Code are exceedingly brief; it only says "parol evidence shall be received at the discretion of the Judges;" nothing else.

510. Do you conceive that the French Judges would be entitled to reject in any case parol evidence altogether, saying that it was an inappropriate case for the admission of parol evidence?

I believe so.† There is another point, with reference to the international view

* The text is as follows:—

"Les achats et ventes se constatent,—

Par actes publics.

Par actes sous signature privée.

Par le bordereau ou arrêté d'un agent de change ou courtier, dûment signé par les parties.

Par une facture acceptée.

Par la correspondance.

Par les livres des parties.

Par la preuve testimoniale dans le cas où le tribunal croira devoir l'admettre."

† The following extract from "Touillier's Droit Civil Français," tom. ix., "De la Preuve," explains the exact import of the law on the subject in France:—"Posons donc en principe que sous la nouvelle législation de même que sous l'ancienne, les tribunaux de commerce sont maintenus dans l'ancien usage de recevoir indistinctement la preuve testimoniale, sans commencement de preuve par écrit, dans toutes les affaires de leur compétence. L'esprit de la loi, sans doute, est que ces tribunaux soient très-réservés dans l'admission de cette preuve; mais enfin, s'ils la reçoivent sans nécessité, ou sans autres adminicules, il n'y a qu'un mal jugé, et non pas une violation de la loi qui s'en repose entièrement sur leur prudence pour admettre ou rejeter la preuve suivant les affaires et les personnes."

Professor Leone Levi.

28th May 1856.

view of the question. What I mentioned as a possible case, namely, a Frenchman purchasing goods in this country, and the Englishman by the law of the land supported in withdrawing from the agreement, has actually taken place in an inverse case. A., an Englishman, was at Calais in France, and engaged another person to collect eggs for him, and to consign them to him in England foa a salary of 100*l.* per annum, whether he collected these eggs or not. B., the Frenchman, brought an action against A. in this country for not taking him into his service as agreed; and the Judges decided that the verbal contract, which was clear and evident, could not be supported here, and no action would lie upon it. And here I may take the liberty of directing your Lordships' attention to one point of the Bill, which, with all deference, I deem to be defective. The Bill abolishes the 17th section of the Statute of Frauds; but by the 4th section of that same Statute, it is enacted, that no action shall be brought to charge any person upon any contract of sale of lands, tenements or hereditaments, or upon any agreement which is not to be performed within one year, unless the same be in writing. The difference between the 4th and the 17th section is this, that whereas according to the 4th section, which I have just given, no action could be laid upon such a contract, by the wording of the 17th section, the contract itself is avoided—it is not good. But if you abolish the 17th section, still the 4th would be in force; and if you have no action upon a contract, it is just the same as if it was void. In the last case which I have mentioned, the 4th section came into operation. I have stated before that a contract itself void in one country is void in another; but in reference to the procedure upon it, a contract may be valid in one country, but if it is to be executed in another, it is according to the mode of procedure in the country where it is to be executed that the law is to act; so that in the case which I have mentioned the contract was valid in France, but no action could be brought upon it in this country, because it was to be executed in this country, and the 4th section prevented any action being brought upon that contract.

511. *Lord Privy Seal.*] Therefore you would say that if you are to repeal the 17th section, you ought to repeal the 4th section also, or at least a portion of it, in order to make the law effective?

Yes; the 4th section refers to five or six items which might be excluded; it refers, for instance, to claims on executors or administrators, on special promises, and to guarantees for debts. Without touching those, in my opinion, it would be necessary to repeal that portion of the section which has reference to agreements not to be performed in one year. That part of the clause would at once militate against the working, as I humbly conceive, of the repeal of the 17th section.

512. It would keep it alive?

It would keep it alive, in the same manner, in fact, as if the other section was not abolished; it would only abolish the avoidance of the contract, but it would not abolish the inability of parties to bring an action upon it.

J. M. Brookes, Esq.

JAMES MARSHALL BROOKES, Esquire, is examined as follows:

513. *Chairman.*] I BELIEVE you are largely concerned in commercial transactions in Manchester?

Yes, as a calico printer and merchant.

514. Are you aware of the present state of the law with regard to contracts of sale, and also as to the practice of Manchester, whether it is in conformity with that law or not?

I am aware of it; while I say that I myself am acquainted with the present state of the law, I do not think that the generality of merchants are acquainted with the state of the law; and the practice in Manchester is in uniform disregard of the law.

515. Will you be good enough to state what is the practice in Manchester with regard to such commercial transactions?

Our transactions in Manchester are, generally speaking (I might almost say with very few exceptions indeed), by oral communications, and without written contracts.

516. Are

516. Are you not in the habit, in cases of purchases and sales, of making written contracts?

We are not; I never in any one instance had a written contract; it may be done in some cases, but it is an extreme exception.

517. Would it produce any inconvenience in the conduct of your business if the system of using written contracts was to be introduced, instead of the present practice of parol engagements?

It would very much interfere with the general business; and in my opinion the system would be impracticable.

518. Do you feel that there is any insecurity in your business, in consequence of its being conducted by means of parol instead of by writing?

Certainly not; I believe, on the contrary, the system of written contracts would much increase the uncertainty and difficulty, as reference would be had only to the express terms which might be in many cases doubtful and inaccurate. It appears to me that the best answer which I can give to that question, is to refer to the immense transactions which are gone into in Manchester without written contracts. If any insecurity was found to result, the practice would doubtless be changed, and the law regarded.

519. Are you aware of any cases in your experience at Manchester, where, in consequence of the present state of the law parties have repudiated their engagements, those engagements having been entered into by parol, because they could not be enforced by law, not having been founded upon written contracts?

I have never had a case myself; I have heard of cases, but not, I must say, frequently; such cases, however, do exist, but very rarely indeed.

520. Do you pursue any different course in the conduct of your business when having transactions with the merchants and commercial people in London, from what you do when you have transactions with the merchants and commercial people in Scotland and in your own neighbourhood?

None whatever; I may say that the great bulk of the business which is done throughout this country, with the exception of such as is done through brokers, and with the exception of cases where people live at some distance from one another, is by oral communications, and not by written contracts.

521. Are you aware whether the practice at Liverpool is the same as the practice at Manchester, or is it more conformable to the practice in London with regard to the use of a written contract?

I may say amongst the brokers, it is the rule to have a written note or memorandum of sale; amongst other commercial men it is generally not so; there are cases, of course, where there are written contracts, but in the generality of cases there is no memorandum in writing.

522. Lord *Overstone.*] When you state that the rule amongst other persons than brokers is not to have written contracts, do you mean that they have not any document or memorandum of any kind in writing in reference to the transaction, or do you refer to contracts in the more strict sense of the word; are you competent to state, of your own knowledge, with regard to the practice of Liverpool, that, with the exception of brokers, all other parties rely entirely upon verbal engagements, and do not strengthen those verbal engagements by any document of a written character of any sort whatever; can you state that of your own knowledge, one way or the other?

I can state that the transactions in Liverpool, except they be done through brokers, are not generally so.

523. When you speak of written contracts, do you mean without any memorandum in writing of any sort or kind; is there no such memorandum upon the broker's note or particulars of sale?

I mean without memorandum of any kind in writing.

524. *Chairman.*] If you were to make a purchase of 100 bales of cotton upon Change at Liverpool, would that transaction be done by means of any written document, or would it be simply a parol transaction between yourself and the Liverpool merchant?

Purchases of cotton are always made through a broker.

J. M. Brookes, Esq.
28th May 1856.

525. Lord *Overstone.*] But what would the broker do?
The broker would simply give me a note of its being bought on my account.

526. Do you go to Liverpool to make purchases?
I do not.

527. *Chairman.*] But you know the way in which business is done?
Perfectly.

528. Lord *Overstone.*] Are you competent to state what are the differences in the practice at Liverpool with regard to contracts for the sale of cotton in hand, of cotton to arrive, and the sale of colonial produce?
I cannot say that I am not competent to give that evidence.

529. Is it or not within your personal experience or observation to be able to state what are the differences, if any, in the practice with regard to those three classes of purchases and sales, namely, contracts for the sale of cotton in hand, contracts for the sale of cotton to arrive, and contracts for the sale of colonial produce of other kinds?
I know that those transactions are done, generally speaking, through brokers, and that it is usual, when the broker has made a transaction of that sort on your behalf, for him to send you a note to say that he has done so.

530. Can you state whether there is any difference in the practice with regard to those three classes of transactions, or whether the practice is the same in each of those three classes of transactions?
I believe the practice is the same.

531. That is an answer given according to your belief, but, as I understand you, not according to your own personal knowledge upon the subject?
I frequently make purchases of produce through brokers, and that is the way in which the business is conducted; the notes intimating the purchase vary in expression to meet the peculiar conditions and nature of the case.

532. Are you a member of the Chamber of Commerce of Manchester?
I am.

533. The Chamber of Commerce of Manchester, I believe, are very vigilant upon all subjects which they conceive to affect the interests of the various classes of traders of Manchester, and they often make representations both publicly to their constituent body, and also to the Government, on the subject of laws which they think require altering or modifying in any way, do they not?
They do.

534. Are you aware whether the Chamber of Commerce of Manchester, in the discharge of that function, have ever, before this Bill was brought in, memorialized the Government or Parliament upon the subject of the existing state of the law as regards the non-admission of parol evidence to establish a contract? Did the Chamber of Commerce of Manchester, before the Report of the Mercantile Law Commission appeared, ever memorialize the Board of Trade, or any branch of the Government, or any official department, upon the subject?
That I cannot answer; I cannot state whether they had done so before the present Bill was prepared.

535. Are you aware of any discussions at the public meetings of the Chamber of Commerce at Manchester in which the grievances of the existing state of the law were brought before their consideration, previously to the appointment of the Mercantile Law Commission?
I do not know when that Commission was appointed.

536. Are you aware of the subject having ever been brought before them?
I am aware of the subject having been brought before them, and fully discussed.

537. When?
I believe some two years ago; I cannot say exactly when.

538. Can you state what the question brought before the Chamber at that time was?
No, I cannot, distinctly.

539. Are

539. Are you quite confident that it had reference to the grievances felt by the town of Manchester under the operation of the law which precluded verbal evidence establishing a contract?

It is the opinion of the Chamber of Commerce that such a law ought to be repealed, and the dishonest trader deprived of the opportunity of evading, by law, the due performance of his verbal contract.

540. I am asking whether the subject brought under the discussion of the constituent body of the Chamber of Commerce was the subject of the grievances felt by the town of Manchester to arise under the state of the law which precluded verbal evidence being brought to establish an unwritten contract?

I was not at the Chamber during the discussion upon that question, but I do know that it was then fully considered.

541. *Chairman.*] Are you not aware that the Chamber of Commerce have expressed an opinion to the Commission upon the Mercantile Law favourable to the alteration at present proposed?

Perfectly so.

542. Is it not also the fact that, since the Bill has been introduced into Parliament, a Petition has been presented to Parliament from the Chamber of Commerce at Manchester, strongly advocating the proposed alteration in the law?

It is.

543. Is it not also your opinion that it would be extremely inconvenient to alter the practice at present in force at Manchester, of conducting commercial transactions by parol instead of by a written contract, as the law prescribes?

I am perfectly sure that it would be almost impossible to do so.

544. Is it your opinion that it would be desirable to make an alteration in the law, so as to make the law conformable to the practice now in force in the district with which you are connected?

I believe it would. Such alterations would not prevent written contracts being taken when thought necessary, and would enable the verbal contracts, almost universally entered into, to be enforced.

545. Lord *Overstone.*] Are you aware that the Chamber of Commerce at Manchester have also expressed their opinion that it is expedient to let in unwritten evidence of the acceptance of a bill of exchange, and also unwritten evidence of the validity of a guarantee?

I have not heard the discussion upon the bill question.

546. Have you read the answers of the Chamber of Commerce of Manchester to the Commissioners, as printed in the Report of the Commissioners?

I have not.

547. *Chairman.*] Is there anything else which you would like to state to the Committee upon the subject?

Yes. I wish to state to the Committee that I do not believe that the mercantile interest generally are aware of the present state of the law. I may state that I met an agent this morning in the City of London, who, when he met me, expressed his surprise that I was in favour of a new Bill which was about to be introduced upon commercial law. I asked him what that Bill was; his reply was, that it was a Bill to make contracts above the sum of 10*l.* not binding unless there was a written contract. I told him that such was the actual law at present, that contracts for money more than 10*l.* were not binding, unless there was some written document or evidence to confirm them. He expressed very much his surprise that that was the present law, and said that it was quite impossible in practice to conform to such a law.

548. You quote this to show the ignorance of people as to the present state of the law?

Yes; and to give the opinion of a man whose daily business is the sale of goods in the City of London.

549. Is there anything else which you would wish to state to the Committee?

I would state that it is the opinion of many of the commercial community, that if oral contracts were allowed to be made, and proof of them were admitted

J. M. Brookes, Esq.
28th May 1856.

in a Court of Justice in the same way as upon most other questions which come before a Court of Justice, it would be much better than the present law, where we are not admitted to be heard unless we have a written contract.

The Witnesses are directed to withdraw.

Ordered, That this Committee be adjourned till Friday next, Four o'clock.

REPORT

FROM THE

SELECT COMMITTEE

ON

METROPOLIS TURNPIKE ROADS;

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

APPENDIX AND INDEX.

Ordered, by The House of Commons, *to be Printed,*
4 *July* 1856.

Lunæ, 2° die Junii, 1856.

Ordered, THAT a Select Committee be appointed, "to consider the expediency of removing the Toll Gates now maintained by the Commissioners of Metropolis Roads, and the means by which such Roads shall be kept in repair in case the Tolls shall be abolished."

Jovis, 5° die Junii, 1856.

Committee nominated of—

Lord R. Grosvenor.	Mr. Wyvill.
Mr. Bramston.	Mr. Hastings Russell.
Sir John Shelley.	Mr. Bonham Carter.
Sir William Jolliffe.	Mr. Alcock.
Colonel Pennant.	Mr. Alderman Challis.
Sir B. Hall.	Mr. Grenfell.
Mr. Hildyard.	Mr. Wrightson.
Mr. Butler.	

Ordered, THAT the Committee have power to send for Persons, Papers, and Records.

Ordered, THAT Five be the Quorum of the Committee.

Jovis, 12 *die Junii,* 1856.

Ordered, THAT Mr. Grenfell be discharged from further attendance on the Committee; and that Mr. James MacGregor be added thereto.

Veneris, 4° die Julii, 1856.

Ordered, THAT the Committee have power to Report their Observations, together with the Minutes of Evidence taken before them.

REPORT - - - - - - - - - - - - iii
PROCEEDINGS - - - - - - - - - - - v
MINUTES OF EVIDENCE - - - - - - - - 1
APPENDIX - - - - - - - - - - - 109
INDEX - - - - - - - - - - - - 121

REPORT

THE SELECT COMMITTEE appointed to consider the Expediency of Removing the Toll-gates now maintained by the Commissioners of Metropolis Roads, and the Means by which such Roads shall be kept in Repair in case the Tolls shall be abolished, and who were empowered to report their Observations, together with the Minutes of Evidence taken before them to The House;——Have considered the Matters to them referred, and have agreed to the following REPORT:

THAT this Committee, impressed with the inconvenience of the existence of Toll-gates in the populous districts of the Metropolis, and of the importance of providing, if possible, some mode of remedying this inconvenience, are nevertheless unwilling, at this late period of the Session, and considering the impossibility of being able to complete the hearing of the Evidence which has been offered to them on behalf of the various parties interested, including the Parishes through which the Metropolitan Roads pass, have come to the determination of reporting the Evidence which has been already given, and recommending the re-appointment of the Committee next Session.

4 *July* 1856.

PROCEEDINGS OF THE COMMITTEE.

Veneris, 13° *die Junii*, 1856.

MEMBERS PRESENT:

Mr. Alderman Challis.	Sir W. Jolliffe.
Mr. Butler.	Mr. Hildyard.
Mr. Wyvill.	Mr. MacGregor.
Mr. Hastings Russell.	Lord R. Grosvenor.
Colonel Pennant.	Mr. Bramston.

Lord *R. Grosvenor* was called to the Chair.

The Committee deliberated as to their course of prooeeding.

[Adjourned till Monday next, at One o'clock.

Lunæ, 16° *die Junii*, 1856.

MEMBERS PRESENT:

Lord R. GROSVENOR in the Chair.

Mr. Alderman Challis.	Mr. Hildyard.
Mr. Butler.	Mr. MacGregor.
Mr. Wyvill.	Sir J. Shelley.
Colonel Pennant.	Mr. Alcock.
Mr. Bonham Carter.	Mr. Bramston.
Sir W. Jolliffe.	Mr. Hastings Russell.
Mr. Wrightson.	

Mr. *Henry Browse* examined.

[Adjourned till Thursday next, at One o'clock.

Jovis, 19° *die Junii*, 1856.

MEMBERS PRESENT:

Lord R. GROSVENOR in the Chair.

Mr. Butler.	Mr. Alderman Challis.
Mr. Hastings Russell.	Mr. Bonham Carter.
Sir W. Jolliffe.	Sir J. Shelley.
Mr. Wrightson.	Colonel Pennant.
Mr. Hildyard.	Mr. Wyvill.
Mr. MacGregor.	

Mr. *Henry Browse* further examined.

Mr. *J. W. Lyon*, Mr. *Vincent Charles Wright*, Rev. *John Philip Gell*, and Mr. *Henry Isaac Neild*, examined.

[Adjourned till Tuesday next, at One o'clock.

Martis, 24° *die Junii*, 1856.

MEMBERS PRESENT:

Lord R. Grosvenor in the Chair.

Mr. Alcock.	Sir J. Shelley.
Mr. Alderman Challis.	Sir W. Jolliffe.
Mr. Butler.	Mr. Hildyard.
Mr. Hastings Russell.	Mr. MacGregor.
Mr. Bonham Carter.	Colonel Pennant.
Sir B. Hall.	Mr. Wyvill.

Mr. *H. Browse* further examined.

Mr. *Richard Thomas Swain*, Mr. *Joseph Pattisson*, Mr. *Augustus Lines*, Mr. *James Fawcett*, Mr. *Henry Gill*, and Mr. *John Barber*, examined.

Adjourned till Thursday, at One o'clock.

Jovis, 26° *die Junii*, 1856.

MEMBERS PRESENT:

Lord R. Grosvenor in the Chair.

Mr. Alderman Challis.	Mr. Wrightson.
Mr. Alcock.	Mr. Hildyard.
Colonel Pennant.	Mr. MacGregor.
Mr. Hastings Russell.	Sir J. Shelley.
Mr. Bonham Carter.	Mr. Butler.
Sir B. Hall.	Mr. Wyvill.
Sir W. Jolliffe.	

Mr. *Joseph Pattisson* further examined.

Mr. *H. Browse* and Mr. *Arthur Ashpitel* examined.

Room cleared. The Committee deliberated.

Mr. *John E. Bradfield* examined.

Mr. *A. Lines* further examined.

[Adjourned till Monday next, at One o'clock.

Lunæ, 30° *die Junii*, 1856.

MEMBERS PRESENT:

Lord R. Grosvenor in the Chair.

Mr. Alcock.	Mr. Wrightson.
Mr. Alderman Challis.	Mr. Hildyard.
Mr. Wyvill.	Mr. MacGregor.
Mr. Hastings Russell.	Mr. Butler.
Mr. Bonham Carter.	Mr. Bramston.
Sir J. Shelley.	Sir B. Hall.
Sir W. Jolliffe.	Colonel Pennant.

The Earl of *Lonsdale* examined.

Room cleared. Committee deliberated.

[Adjourned till Thursday next, at One o'clock.

Jovis, 3° *die Julii*, 1856.

MEMBERS PRESENT:

Lord R. GROSVENOR in the Chair.

Mr. Alderman Challis.	Colonel Pennant.
Mr. Alcock.	Mr. Butler.
Mr. Hastings Russell.	Mr. Bonham Carter.
Sir W. Jolliffe.	Sir B. Hall.
Mr. Wrightson.	Mr. Bramston.
Mr. Hildyard.	Sir J. Shelley.
Mr. MacGregor.	Mr. Wyvill.

Room cleared.

Committee deliberated, and agreed to the following Report:—"That this Committee, impressed with the inconvenience of the existence of toll gates in the populous districts of the metropolis, and of the importance of providing, if possible, some mode of remedying this inconvenience, are nevertheless unwilling, at this late period of the Session, and considering the impossibility of being able to complete the hearing of the Evidence which has been offered to them on behalf of the various parties interested, including the parishes through which the Metropolitan Roads pass, have come to the determination of reporting the Evidence which has been already given, and recommending the re-appointment of the Committee next Session."

Ordered to Report.

LIST OF WITNESSES.

Lunæ, 16° *die Junii*, 1856.

Henry Browse, Esq. - - - - - - - - - - - p. 1

Jovis, 19° *die Junii*, 1856.

Henry Browse, Esq. - - - - - - - - - - - p. 18
James Wittit Lyon, Esq. - - - - - - - - - - p. 24
Vincent Charles Wright, Esq. - - - - - - - - - p. 26
Rev. John Phillip Gell - - - - - - - - - - p. 31
Henry Isaac Neild, Esq. - - - - - - - - - - p. 33

Martis, 24° *die Junii*, 1856.

Henry Browse, Esq. - - - - - - - - - - - p. 41
Mr. Richard Thomas Swain - - - - - - - - - - p. 45
Mr. Joseph Pattisson - - - - - - - - - - - p. 46
Mr. Augustus Lines - - - - - - - - - - - p. 51
Mr. James Fawcett - - - - - - - - - - - p. 56
Mr. Henry Gill - - - - - - - - - - - - p. 57
Mr. John Barber - - - - - - - - - - - - p. 57

Jovis, 26° *die Junii*, 1856.

Mr. Joseph Pattisson - - - - - - - - - - - p. 59
Henry Browse, Esq. - - - - - - - - - - - p. 63
Mr. Arthur Ashpitel - - - - - - - - - - - p. 63
Mr. John Edwin Bradfield - - - - - - - - - - p. 66
Mr. Augustus Lines - - - - - - - - - - - p. 77

Lunæ, 30° *die Junii*, 1856.

The Right Honourable the Earl of Lonsdale - - - - - - - p. 85

MINUTES OF EVIDENCE.

Lunæ, 16° *die Junii*, 1856.

MEMBERS PRESENT.

Lord Robert Grosvenor.	Mr. Bramston.
Sir John Shelley.	Sir William Jolliffe.
Colonel Pennant.	Mr. Hildyard.
Mr. Butler.	Mr. Wyvill.
Mr. Hastings Russell.	Mr. Alcock.
Mr. Bonham Carter.	Mr. Wrightson.
Mr. Alderman Challis.	Mr. James MacGregor.

LORD ROBERT GROSVENOR, IN THE CHAIR.

Henry Browse, Esq., called in; and Examined.

H. Browse, Esq.

16 June 1856.

1. *Chairman.*] YOU are Surveyor to the Metropolis Roads Commission, are you not?—I am.

2. How long have you been in the employment of the Metropolis Roads Commission?—From the commencement, in 1827, till the present time.

3. During that time have you been the principal surveyor?—Not until after the death of Mr. Macadam.

4. Mr. Alderman *Challis.*] At what date was that?—1853.

5. *Chairman.*] Sir James Macadam was the surveyor at the beginning, was he not?—Yes, until 1852, when his son succeeded him, and he remained there till March 1853.

6. During the whole of the time, from 1827 till the present moment, you have been employed under Sir James Macadam in the first instance, and afterwards as principal surveyor?—Yes.

7. I believe the Commission was constituted under an Act of Parliament, the 7th of George the 4th, chapter 142?—Yes.

8. That was the year 1826?—It was.

9. There was a subsequent Act of the 10th of George the 4th, which somewhat affected the Commission, was there not?—Yes, chapter 59.

10. That was in the year 1829?—It was.

11. Did the Act of Parliament confer any fresh powers on the Commission?—It was obtained chiefly for the purpose of equalising the tolls, in order to make a more equal distribution of the tolls. There were 14 trusts, and the scales of tolls were different upon every one of them, some of them being very short and some very long, and an Act was obtained to enable the Commissioners to equalise the tolls, and, as nearly as they could, to establish a rate of 3 *d.* per horse for seven miles, and to pay an additional toll after passing seven miles; there were some exceptions to that rule.

12. Can you inform the Committee what was the length of the roads which were delivered over to the trust in the year 1826?—About 130 miles.

13. Those roads were constituted of a number of different trusts, were they not?—Yes, 14 separate trusts.

H. Browse, Esq.

16 June 1856.

14. Did the Commission continue those trusts as their divisions of the work, or did they constitute districts?—They continued the trusts for the division of the work, but for the collection of the tolls the districts were altered.

15. How many districts are there at the present moment?—Sixteen for the collection of tolls.

16. Will you state to the Committee what those different districts comprise; take the first?—By reference to the plan the Committee will see that I have numbered the districts.

17. Is the plan which you hold in your hand a plan showing the extent of the metropolis roads under the Commission?—It is.

18. Is this plan numbered so that it will show the various districts?—It is. No. 1 applies to the district called the Kensington Roads.

19. That is the district coloured light yellow?—Yes; it is the district of the old Kensington Trust. I should take the opportunity of mentioning that No. 1, according to the collection of tolls, should extend into the town of Brentford, being seven miles; it comprises part of the Brentford district for the toll collection, because the second payment of toll does not commence till after you have passed the seventh milestone, which is in Brentford.

20. The second district is the Brentford and Isleworth road, which is coloured light brown?—It is.

21. What is the third district?—The third and fourth comprise the Uxbridge-road.

22. What is the fifth district; the new road at Shepherd's Bush, connecting the Uxbridge and Brentford roads together.

23. What is the sixth district?—The Harrow-road.

24. The seventh and eighth?—The Edgeware-road.

25. The ninth and tenth?—The ninth is the Hampstead and Highgate Trust, and the 10th is the City-road.

26. What is the 11th?—The 11th, 12th, and 13th comprise the Stamford-hill and Green Lanes Trust.

27. What is the 14th?—The new road, called the Seven Sisters Road, leading from the Regent's Park to Tottenham.

28. What is the 15th?—The Hackney Trust.

29. What is the 16th?—The Lea Bridge.

30. Besides those districts there are two trusts, are there not, which have since been added?—There are.

31. What are they?—The Marylebone and Finchley Trust, and the New North-road Trust.

32. Are those all represented upon this map?—They are not; they did not form part of the original, nor do the Commissioners now repair them. They are merely placed under the care of the Commissioners of the Metropolis Roads for the collection of the tolls, and distributing the money in liquidation of the debt, in accordance with the Act passed in 1849–50, the parishes repairing the roads.

33. By districts are the Committee to understand that a separate toll is levied upon each district?—Yes.

34. Mr. *Hildyard.*] Do you mean a toll collected by a separate person?—No, a separate toll.

35. Is it different in each case?—No; there are some differences.

36. *Chairman.*] Supposing a person passes from one district to another, is an additional toll taken in each district?—Yes.

37. Colonel *Pennant.*] Were those tolls so collected in each district applied to the purpose of paying the particular debts of those districts, or was the debt paid off generally by the trust?—The debt was paid off generally.

38. *Chairman.*] The Commissioners took the roads in 1827, did they not?—Yes.

39. By an Act passed in 1826?—Yes.

40. What was the state of the roads generally when they first took them in hand?—The roads then were wholly, or nearly so, made with local gravel; that was quite insufficient for carrying the very heavy traffic so near the metropolis, and in the winter time great portions of the road were in a very bad state.

41. Was there a considerable debt upon the trust at that time?—The bonded debt at the commencement of the trust was 114,000*l.*, and there were annuities payable

payable out of the tolls upon some of the districts, which were afterwards redeemed by the Commissioners at a cost of 36,000 *l.*, making together 150,000 *l.*

42. Therefore at the commencement of the operation of this Commission, the roads were in a very bad state, and the debt upon the Trust amounted to 150,000 *l.*?—Yes.

43. Is there any debt now?—There is not.

44. Since that time the whole of the debt has been paid off?—It has.

45. Are the roads in a good condition?—Yes.

46. The whole of this 130 miles of road was not then, and is not now, maintained by the toll, is it?—No.

47. What part is not?—There is no part specifically maintained by any other funds, but there are other funds which are applied to certain districts.

48. What funds are those?—The estates of John Lyon and the Harvist Estate.

49. What is the Harvist Estate?—Some land at Holloway.

50. From what does the fund arise?—By the will of John Harvist, he left certain property to be applied to the improvement and repairs of the road from London to Edgware.

51. What is Lyon's Trust?—That was also given by will for the repair of the road from London to Edgware, and London to Harrow.

52. Lyon was the founder of Harrow School, and the road at that time was in such a miserable state that in order to enable his scholars to get to school he left his estate, half of which was for the maintenance of the school, and half for the maintenance of the roads?—I am not exactly aware of the proportions, but a portion of the estate was left for the purpose of repairing the roads.

53. How long have those roads been under the management of the Commission?—Since 1827.

54. Did the funds of those trust estates come simultaneously into the hands of the Commission with the roads?—Yes.

55. Have the Commissioners taken the money arising from those estates for the indiscriminate repair of all the roads about London, or is a separate account kept, and is the amount so obtained applied solely to the repair of those particular roads?—Separate accounts are kept for those particular roads; it is expressly so directed by the Act of Parliament of the 7th of George the 4th.

56. You stated that the roads under the control of the Commission originally amounted to about 130 miles; is that so now?—The map shows that we have now 121 miles.

57. What has become of the other nine miles?—They were given up to the parishes by the Act of the 10th of George the 4th, and an Act for improving Chelsea parish, passed in 1845.

58. Therefore at two different times, since the commencement of the duties of the Commission, a distance of road amounting altogether to nine miles has been given up to those parishes?—Yes; more than that, inasmuch as the Commissioners have made new roads to the extent of nearly six miles, therefore nearly 15 miles have been given up to the parishes.

59. Did the parishes make any objection to taking those roads?—The Commissioners applied for an Act, the 10th of George the 4th, and put into that Act a list of certain roads, upon which they thought it desirable to discontinue the gates; among those was the City-road; and the parish of St. Luke's proved before a Committee of the House of Commons, that the cost to be thrown upon their parish would be an increased rate of 4 ½ *d.* in the pound. The Committee considering that too great a tax upon them, compelled the Commissioners to continue the gate and keep the road.

60. Did the other parishes oppose it?—There was some opposition, but I do not remember exactly to what extent. The Committee of the House of Commons considered it right that the other parishes should take the roads which the Commissioners were desirous of giving up.

61. Was there any dispute between the Commissioners and the parishes as to the amount of rate that that would impose upon the parishes?—No.

62. The Commissioners were of opinion that it would impose upon the parish of St. Luke's a rate of about the amount which you have stated?—The exact expenditure at that time was about 4 ¼ *d.* in the pound, but the parish

H. Browse, Esq. contended that it would take full 4½ *d.* to collect that amount. There was no difference of opinion about that.

16 June 1856.

63. Was not it the fact that at the early period of the Commission they not only repaired the road, but, in some instances, paid for lighting and watching?—Only till the 10th of George the 4th; it was all discontinued after that.

64. From the commencement of the Commission till the 10th of George the 4th, they, in some instances, paid for lighting and watching and repairing the road?—Yes, but they collected a rate for that purpose.

65. And that they threw upon the parishes by the 10th of George the 4th?—Yes.

66. And they have never collected or expended a rate since the 10th of George the 4th for lighting and watching?—No.

67. In the early reports of the Commission it is stated that one of the objects for which they were constituted was to remove the toll-gates from the populous parts of the city, and that opinion is repeated in three or four of the first reports, but subsequently to that time no mention is made of it, so far as I can see. Is it not the fact that after the year 1830 the calculations of the Commissioners were a good deal disturbed by the construction of the several railways about London?—The construction of the railways entirely changed the nature and character of the traffic on those roads that were affected by them.

68. After the first three or four years the attention of the Commissioners was more directed to the maintenance of their tolls and to the equalisation of the expenditure than to other subjects?—Their attention was directed to the general improvement of the roads notwithstanding the character of the traffic was changed.

69. The Commissioners were very apprehensive, after the year 1831, that the railways would seriously endanger the stability of the roads and their power of paying off the remainder of the debt?—Their attention was directed to that immediately the railways began to change the traffic.

70. After the 10th of George the 4th no attempt was made by the Commission to take away the toll-bars from the populous districts in pursuance of what they had desired to do up to that time?—Yes, they continued to remove gates from London as far as they could, but their attention certainly was directed to raise a sufficient fund to enable them to liquidate their debt proportionally.

71. Subsequent to that Act, which threw upon the parishes those 16 miles of road, what gates had they removed?—In 1830 ten miles of road were given up to the parishes by the 10th of Geo. 4. In 1833 the gate at the Stones' End at Shoreditch was removed, freeing half a mile of road towards Kingsland; in 1834 the side-bars in the Uxbridge-road were discontinued; in 1837 the Pineapple gate was removed to Kilburn Bridge, being another half mile; in 1845 the roads in Chelsea parish were given up to the parish by their Act. The parish of Chelsea applied for an Act to improve the parish, and in it they inserted clauses giving them powers to take the roads and powers to take down the gates. The gates were removed, and one other gate was removed a mile beyond, in the Fulham-road. The Act was obtained in 1845, and took effect in 1846. In 1846 the Kingsland-road gate was discontinued, freeing a road a mile and a quarter from the commencement of the trust at Shoreditch.

72. Sir *W. Jolliffe.*] The gate is a mile and a quarter further away from London than it was previously?—Yes; and the Shoreditch gate, also on the Hackney Trust, was discontinued at the same time, together with four side bars on the road. In 1847 the Harrow-road toll was reduced from 3 *d.* to 2 *d.*, and the gate was removed to where it now stands, at Ormes Green, being a mile from the commencement of the trust. In 1834 the gate at Bayswater was discontinued; the first toll payment now is at Notting Hill, instead of being at Bayswater.

73. Mr. *Bonham Carter.*] How far was it moved?—It is now a mile and a half from the commencement of the trust; it was about half a mile. In the case of the Kensington toll also, before 1830 the gate, which is now at Kensington, was at Knightsbridge; that is a mile and a quarter from the commencement of the trust.

74. *Chairman.*] Have you mentioned all the removals?—Yes.

75. What

75. What is the date of the latest removal?—1847.

76. For the last nine years no material alteration in the position of the gates has taken place?—No.

77. You have stated that they were removed so much further from the commencement of the trust; when those gates were removed, was the district diminished, and does the Commission still continue to repair the whole of the roads on the trust, or is any portion thrown on the parishes?—None, except in the parish of Chelsea.

78. Was that done by agreement or by Act of Parliament?—By Act of Parliament; the Commissioners offering no opposition to it.

79. Was the Act brought in by the Commissioners or by the Chelsea parish?—By the Chelsea parish.

80. The Commission have brought in no Act for that purpose, since the 10th of George the 4th?—No.

81. And the whole diminution since the commencement is about 16 miles up to the present time?—Yes.

82. Can you inform the Committee how it happens that no removal of gates has taken place for the last nine years?—The removal of the gates further from London has caused a great diminution in the income and has increased the expenditure, inasmuch as since the establishment of omnibuses, they invariably run to the turnpike-gate and there stop; so that when a gate is removed further from town, there are two things which affect the trust, the loss of income and the increase of expenditure.

83. How is the expenditure increased?—All the omnibuses run to the gate and pay no toll; they do not go through the gate, but they stop at it.

84. Wherever the gate is, there the omnibuses stop?—Yes, it is generally so.

85. And you imagine that if the gate were removed the omnibuses would continue to run to the next gate?—Yes, in almost all instances.

86. Do you make that statement from experience, or do you guess at it?—I speak from experience.

87. Do you find that really the same number go?—I think so, but I am not quite sure.

88. It might be that the same accommodation would not be required?—Probably not.

89. Your opinion seems to be that, upon the whole, the wear and tear, as far as omnibuses go, would be pretty nearly the same?—The wear of the road will be in proportion to the distance.

90. Will you state to the Committee what is the amount of toll now collected?—The amount of toll to the 25th of March last was 60,397 *l.*

91. What was the amount of toll in the first year?—About 77,000 *l.*

92. You do not include in either of those sums the income from the estates?—No.

93. Does not the income from the estates for the last year amount to 3,416 *l.*?—Yes.

94. And there are other small sums included, making altogether 65,600 *l.*?—Yes.

95. What was the amount received from the trust property in the year 1827?—The account of the 25th of March 1828 shows the total revenue to be 75,600 *l.* The composition in lieu of statute duty which was then collected was 1,300 *l.*; the lighting rates were 1,000 *l.* It does not appear that there were any receipts from the estates in that year.

96. What was the total revenue for that year?—£. 115,000 *l.*

97. What was the income from tolls in the year 1827–8?—£. 75,643.

98. The trust property does not appear to yield anything?—Only 125 *l.* The composition in lieu of statute duty was 1,300 *l.*

99. Was there any composition from the magistrates of Middlesex from the county rate, for the repair of roads in that year?—There does not appear to be any in that year.

100. If you exclude the composition for statute duty, the income would appear to be 75,768 *l.* in 1827?—There was the receipt for weighing engines, 126 *l.*

101. They are abolished now?—Yes, they are abolished now.

102. In the present year it is 64,160 *l.*, including the trust property?—Yes.

103. Then, in fact, the income, as far as that comparison would show, seems to

H. Browse, Esq.

16 June 1856.

to be diminished only by 11,000 *l.* in the year 1856 from what it was in the year 1827?—Yes.

104. The establishment expenses are stated in the last Report to be 3,695 *l.*?—It is so.

105. Can you furnish the Committee with a list of the establishment, and the various salaries paid in detail?—I think I can.

106. Will you have the goodness to do so?—Yes, it shall be furnished to the Committee.

107. The account of the expense of keeping up toll-houses is not stated in this Report; where is that to be found?—That is included in the amounts paid by the tradesmen's bills, the carpenters, smiths, bricklayers, and so on.

108. Could you furnish to the Committee a separate account of the amount paid annually for keeping up the toll-houses, the side-bars, the tickets, and the payment of men employed by you for the purposes of collection?—I could not furnish an account of the amount paid for the collection of the toll, because if the Commissioners can let the roads, they do always let them.

109. I refer to those roads where the tolls are collected by the Commissioners?—In the case of those roads which are in hand, I shall be able to furnish an account of what is paid for the collection.

110. Colonel *Pennant.*] In this statement of extraordinary expenses of the year, there is the purchase of Exchequer bills, 10,263 *l.*; have those been bought during the last year?—They have.

111. Is that a new thing?—It is a new thing; the Commissioners have had a surplus by an accumulation during the last five or six years over the amount of floating debt.

112. There has been no interest received on those Exchequer bills?—Not at present; the Commissioners had no surplus sufficient to invest in Exchequer bills previously to this year.

113. *Chairman.*] Can you inform the Committee how it happens that, considering the large debt which there was originally upon the trust which is now paid off, and the greater extent of road which the Commission had originally to maintain with an income diminished to only so small an amount as that which we have already calculated, they still have to expend the whole of their income in the repair of those roads?—They have not expended all their money, inasmuch as it will be seen that there is an accumulation of 5,000 *l.* and upwards during the last four years. In 1851, when the debt was liquidated, it would appear that the Commissioners had a balance of only 1,000 *l.* in hand. The increased balance now, over their floating debt, is 5,000 *l.*, but they have spent in improvements during the last five years 4,500 *l.* The increased wear upon the 15 miles of road within the gates where they receive no toll, is 100 *l.* per mile more than in 1851. Having an accumulation of surplus fund for the last four years, the Commissioners in 1855 reduced the toll upon the ninth district, or the Hampstead and Highgate roads, from 3 *d.* to 2 *d.*, it being impossible to remove the gates upon that road further from the commencement of the trust without annihilating the trust altogether. The Islington gate, for instance, could not be removed without discontinuing the trust. The Commission could not do that, and therefore they reduced the toll at a cost of 3,500 *l.* They offered those tolls on Friday last at that reduced price, but they could not obtain a bidding. It is the general impression that they are very much too dear, and the Commissioners are determined to keep them in their hands till next year, in order to ascertain their value. It will be seen that the reduction made there was of a greater amount than had been devoted in the year generally towards the liquidation of the debt. The amount devoted towards paying the debt generally was 2,500 *l.* per annum; it was rather over that. Many years it was that, and occasionally it was something more; there were exceptions to that; some years it was more; that was the standing amount that the Commissioners appropriated to the purpose out of their usual funds. Then after three or four years, when they had an accumulation, they paid 5,000 *l.* and 7,000 *l.*

114. You do not mean to represent that 2,500 *l.* is the average?—Certainly not.

115. They were enabled to pay a larger sum sometimes?—Yes, that was the minimum.

116. During

116. During the last nine years, have the Commissioners made any attempt whatever to remove those gates further away from the metropolis?—No, there has been no removal.

117. Their opinion being, I presume, that if they were to remove them, they could not repair the roads?—They had not sufficient surplus income to warrant them in removing the gates further from London.

118. Do you know whether it is the intention of the Commissioners now to remove any of them further off, considering that they have a surplus beyond their expenditure?—They will not have a surplus this year. The estimated amount of income this year is 64,950 *l.* from all sources; the estimated expenditure is 64,945 *l.*

119. Therefore they calculate that they will not have a balance?—No. Out of that amount they have on their hands two districts, namely, the tenth and the fifteenth, and sixteenth, amounting to 19,000 *l.* It is evident they are not worth that money, or the toll lessees, in all probability, would have bid for them; therefore the Commissioners will have to collect them, and may anticipate a reduction, rather, in the amount of receipt.

120. During almost the whole of the time that the Commissioners have acted, they have let the tolls if they could?—Always.

121. And it has been invariably found that a larger sum of money can be obtained by letting than in any other way?—Invariably so.

122. As the population of the districts has increased in which the toll-gates are situated, have you not been necessitated to put up a great many side-bars?—Yes.

123. In proportion as the population increases, and new streets are opened, new side-bars are put up?—Yes.

124. And notwithstanding all that, the tolls are very much evaded?—In some cases they are very much so.

125. So that the effect has been, that the parish has had to bear the amount of wear and tear upon those roads over which the traffic has passed to evade the toll?—Yes.

126. So that in that respect some parishes would gain, and others would lose, by the removal of the tolls, in consequence of this aberration of the traffic?—The traffic that goes to avoid the gate does not go wholly off the road; they turn off for a short distance only, and wear the turnpike-road to a certain extent; they turn off just sufficient to avoid the gates.

127. Does the traffic desire beyond anything to avoid the toll, and will it not go almost any distance in order to do so?—It is the fact that it will go a great distance in order to avoid the toll.

128. Have you observed at all what is the effect upon the surrounding property with regard to buildings, upon removing a gate from one place to another?—I have not paid much attention to that fact.

129. You cannot say whether the buildings spring up very much in the distance between where the gate has been and where it is placed, and then stop again on the other side?—No, I have not noticed that fact particularly.

130. Do the railways which are now constantly made continue to affect the value of the tolls much?—Some of them do; the Woodford and Layton Railway, which is likely to be opened during this year, is the cause, I believe, why the fifteenth and sixteenth districts did not let.

131. What is the name of the railway which goes from Camden-town to the Blackwall Railway?—It is the East and West London Junction.

132. Has that railway affected the toll much?—Not much.

133. Are any of the trusts in debt?—Separately they are.

134. Which is in debt?—The Kilburn and Edgeware.

135. When I speak of trusts, I mean those roads which are supported by trust property?—Yes, that is a road supported by trust property.

136. That road is in debt?—It is.

137. From what cause does that arise?—The expenditure exceeded the income, and a great debt was handed over by the Trustees to the Commissioners.

138. Was there a debt upon the Harrow-road at the time that it was handed over to the Commissioners?—Yes.

139. Has that road been supported by tolls as well as by trust property?—It has.

H. Browse, Esq.

16 June 1856.

140. What is the state of the road now?—There is a toll-gate still upon it.

141. Applicable to that trust?—Yes.

142. Where does it commence?—At the canal bridge at Paddington.

143. Can you state, in a way that would be comprehensible to a person who reads it, the commencement and termination of each trust?—Yes.

144. Will you do so?—Yes. The first district commences at Knightsbridge, at the crossing of the Great Ranelagh Sewer, in the road which is at Albert Gate.

145. Where does the first district terminate?—The main road terminates at Counter's Creek, or the West-London railway. The Fulham-road terminates at the end of Putney-bridge.

146. Which bridge do you mean?—The Fulham and Putney-bridge.

147. Where does the second district commence?—At Counter's Creek. The Kensington canal basin now joins the road there, and goes to the Powder-mill bridge, on Hounslow Heath, and to Cranford bridge, on the Bath road.

148. Where does the West-London railway go to?—From Kensington Basin to Wormwood Scrubs.

149. Where does the third district commence?—The Isleworth-road commences at Sion House, Brentford, and goes to Hamptonwick, in the parish of Teddington, considerably beyond the lock, to the boundary of Teddington parish; and there is a branch through Isleworth.

150. Where does the fourth district commence?—The third and fourth commence at Tyburn and end in the town of Uxbridge, with a branch from Hanwell to Brentford.

151. Where does the fifth district commence?—The fifth commences a junction with the third at Shepherd's Bush, and joins the second near Turnham-green. The sixth commences at the Canal bridge, in the Harrow-road, in the parish of Paddington, and terminates about four furlongs beyond the tenth milestone through the town of Harrow.

152. Where does the seventh district commence?—It commences at the Canal bridge, at Maida hill, and terminates at Sparrow's Hern, at Bushy, in the county of Hertford, passing through Edgeware and Stanmore.

153. Where does the ninth district commence?—The ninth commences at St. James's Chapel in the Hampstead-road, in a line with the Tottenham-court-road, and goes to Hampstead, to the Red Lion, with a branch from Camden-town to the Gate-house at Highgate. It commences at the Great Northern Station at Battle-bridge, joins the other road at Camden-town, and has a branch going past Saint Pancras Workhouse, and joining again the Kentish-town road. That district also comprises the road from the canal bridge at the Regent's Park, and goes to the New City Prison at Holloway. It commences again at the top of Saint John-street and the City-road, in the parish of Clerkenwell; passes by two roads to Holloway, called the front and back roads, which join at Holloway, and continues to the Gate-house at Highgate, meeting the other branch. It also goes from the Watch-house at Islington-green to Newington-green, with a branch from Ball's Pond to Kingsland. The tenth district commences at Finsbury-square and ends at the Blue Coat Boy at Islington.

154. Where do the eleventh and twelfth districts commence?—At the Stones' End at Shoreditch, and they terminate at the boundary of the county near Waltham-cross, with a branch from Lower Edmonton to Enfield. The thirteenth district commences at Newington-green, where the ninth district terminates, and goes to the Market-house in Enfield, by Bush-hill. The fourteenth district commences at the City Prison, and terminates at the Seven Sisters Trees, making a junction with the eleventh district. The fifteenth district commences at the Stones' End at Shoreditch, passing by Cambridge-heath, through Hackney, and joins the eleventh district at Stamford-hill, with a branch from Cambridge-heath to the Mile End-road, and another branch from Hackney-street to Kingsland. The sixteenth district commences at Clapton, joins the fifteenth district, and ends at the Eagle at Snaresbrook on one side, with a new road formed from Whip's-cross to Woodford.

155. Can you inform the Committee who paid the 1,300 *l.* which is stated in the first or second Report under the head of Statute-labour?—The surveyors of highways of the different parishes.

156. When was that done away with?—To the best of my recollection, it was done away with by the General Highway Act of 1834. There was a receipt of that kind in 1836. There does not appear to be any receipt of that kind in 1840.

1840. There was a small sum of 59 *l.* received under that head in 1838, and that appears to be the last receipt. That, I apprehend, must have been a debt owing before.

157. The Statute labour ceased in 1837?—Yes.

158. Mr. Alderman *Challis.*] You have divided them into 14 districts; do you keep the sum of money collected in each district and appropriate it for the purpose of keeping up the roads, or does it go to a total sum?—It goes into a general account. The first and second districts are let together, and the receipt is applicable to what was the Kensington, Brentford and Isleworth Trusts.

159. Do you keep separately the amounts collected from one, two, or three districts, and appropriate those amounts to keeping up the roads of those districts?—No, I think not.

160. If one district occupies three miles do you fix a definite toll according to the number of miles which the turnpike covers?—Yes, generally so. The only exceptions to the general rule are the Edgware-road and the Harrow-road. There the Commissioners are compelled by the Act to keep separate accounts.

161. Mr. *Butler.*] Can you give an account of the receipt and expenditure in respect of each trust or division?—As they are let they can be furnished, but not otherwise.

162. *Chairman.*] Can you not furnish an account of the receipts and expenditure for each trust the last year?—No, I think not. The districts are amalgamated with the exception of those two which I have mentioned.

163. Can you put in an account of the length and cost of the metropolis roads within the limits of the Metropolitan Local Management Act, together with the amounts of assessment to the poor-rate, and the rate in the pound?—I have a statement here showing that. (*The same was delivered in*). *Vide* Appendix.

164. Sir *William Jolliffe.*] Is that the actual cost of repairing those portions of road?—Yes; that is the expenditure, exclusive of any establishment charges, or for the repairs and holding turnpike gates.

165. You have described the roads that have been given up at various times to the parishes to the extent of some 15 miles; besides that gates have been removed on other roads which you have described, to a much greater distance from the metropolis; is that so?—Yes. The roads have not been given up in that case.

166. Do you find that the traffic upon those portions of the road which are thus freed from the gates has very much increased?—Yes, very much.

167. And that that traffic is of a nature very much to wear the road?—It is.

168. Is it omnibus traffic?—Omnibus traffic chiefly.

169. Do you find it very expensive to maintain the road under that particular description of traffic?—It is.

170. How many miles of road have been thus freed of tolls, the maintenance of which has not passed out of the hands of the trust?—The length of the roads now within the gates on the London side, of the gates which the Commissioners repair, and upon which they receive no toll, is 11 miles and five furlongs.

171. At what cost is that 11 miles and 5 furlongs of road maintained?—As nearly as I can ascertain, at 15,700 *l.*

172. That is perhaps the most expensive part, considering the distance?—It is the most expensive, decidedly.

173. The whole of these roads are subject to a heavy traffic?—Very heavy.

174. And no toll is collected upon them?—No toll is collected upon them.

175. You were asked with regard to the reduction of toll which diminished the income of the trust last year to 4,500 *l.* within the Islington district, and you stated that the gates in that district could not be further removed, and that induced the Commissioners to make that reduction?—That was the cause; it was in order to grant some relief to that district, as an equivalent to that which they had granted to others, by removing the gates.

176. You have not described why the gates in the district could not be put further off; what was the cause of that?—They could not be protected without

H. Browse, Esq.

16 June 1856.

erecting an immense number of side bars. If the Islington gate were taken away, wherever you might place it it would be void.

177. The loss of the whole revenue would be the result?—A very great portion of it.

178. Mr. *Bonham Carter.*] You stated that there are 11 miles and 5 furlongs within the gates?—Yes.

179. What was the original quantity within the gates when the Commissioners undertook the trusts?—I should almost say none at all: the gates were at the commencement of the trusts in almost all instances.

180. Are the Committee to understand that almost the whole of this 11 miles and 5 furlongs has been given by the Commissioners to the inhabitants within the gates since the commencement of the trust?—I may say the whole, with the exception of about four furlongs, which is the City-road.

181. Mr. *Butler.*] It would appear that the maintenance of this 11 miles and 5 furlongs is thrown upon the other portions of the district?—Upon the tolls that are received beyond.

182. Perhaps Hackney?—Yes.

183. *Chairman.*] I believe that the gates have been removed specially with reference to the more populous districts, have they not?—And with reference also to the income, wherever there was anything like a surplus.

184. Probably those 11 miles and 5 furlongs that are now on the London side of the gates are entirely inhabited districts?—Yes; generally so.

185. In point of fact, the result of that reduction has been to throw the expense of maintaining those 11 miles and 5 furlongs entirely off the people, whose roads are maintained by it, and to put it upon those who go beyond the gates?—Yes.

186. Mr. *Hildyard.*] Does not that assume that the persons who live within never pass through the gates in their way out?—All people going through the gate would have to pay, but it assumes that they never go that way.

187. Sir *William Jolliffe.*] Those districts that were given up to the parishes are entirely town districts, almost streets?—They are quite streets.

188. With regard to the Chelsea district, what has been the result of the roads being taken by the parish there; has not that district become, since that period, almost entirely a town district?—It was so previously. I see but very little difference, so far as the buildings go. The parish was generally almost covered before the roads were given up.

189. At what period was that?—In 1846.

190. You are not so much acquainted with that district since the roads have been given up, as you were when they were under your superintendence?—I do not go so frequently over them.

191. You do not know what the difference of population is?—No.

192. Colonel *Pennant.*] Do you know the condition of those roads?—Yes; they are tolerably good. They were not roads of great thoroughfare; they were side roads rather, in Chelsea parish.

193. Mr. *Wrightson.*] Can you give the Committee the number of paying gates at the time that the Commission commenced, and the number of paying gates at this time, upon the 130 miles of road, whether side bars or gates?—Yes; the last report has a table showing the number of gates and bars upon each of the several districts; every report has that; you will find here the side bars and gates. There were 36 gates upon the whole of the trust on the 25th of March 1856 and 81 side bars; I should observe that the side bars are only checks to the gates.

194. Mr. Alderman *Challis.*] What was the number at the commencement of the trust in 1827?—I do not think you will find that in 1827, but in the report of 1828 you will find that there were 45 gates and 45 side bars.

195. Do you count the number of 81 now instead of 45 in consequence of the districts becoming more populous, and therefore it is necessary, in order to protect the gates, to put up side bars?—Yes.

196. *Chairman.*] They were, in 1828, 90, and they are now how many?—117.

197. Mr. *Hildyard.* You have stated that an omnibus is a vehicle which wears the road a good deal in proportion to the toll that it contributes?—Yes, I am of that opinion; that it we ars the road more in proportion than almost any other traffic.

198. The

198. The increase in the number of omnibuses since this trust commenced has been very great indeed?—There was not any before; the whole number is an increase.

199. That is a burdensome description of traffic that has grown up since the commencement of the trust, and it is increasing probably every day?—Every day, more particularly since the opening of railways.

200. Since the railways reached the metropolis, there has been an enormous increase in the coal traffic over this district, has there not?—Yes.

201. Is coal traffic an expensive traffic?—The coal traffic and the great commerce of this metropolis, heretofore was carried upon six-inch flat wheels at a foot pace; but the character of the traffic has entirely changed; the whole of the heavy weights of commerce are carried now upon narrow wheels of four inches upon very light springs, consequently the whole weight is constantly vibrating.

202. The quantity of coal carted over this district has enormously increased since the coals have been supplied inland from Staffordshire and Derbyshire?—Certainly.

203. Sir *William Jolliffe*.] And a great many of those vehicles carrying those heavy goods, move at a trot?—At the rate of six miles an hour, with three or four tons.

204. Mr. *Hildyard*.] When you remove a bar, you find that an omnibus will take advantage of the road till it gets to the bar, and then stop; is that the case also with cabs?—To a very great extent. People that want to go half a mile or a mile beyond a gate, will take a cab to the gate and then discharge it.

205. You have told the Committee the material with which the roads were repaired before the commencement of the Commission; with what did you once repair them; you now repair generally with granite?—Yes.

206. Did you do so in the first instance, or have you increased the quantity of granite that you use now?—At the commencement, not a mile of the whole of the roads was repaired with granite, and it now extends to upwards of 50 miles. That has been done progressively, but more particularly since 1836, since the railways were instituted. Previously to that time, the Commissioners continued to use the Kentish flints and local gravel; but since the great increase of traffic within the Metropolitan district, it has been absolutely necessary to repair the roads with granite.

207. That is an increased source of expenditure that has been gradually growing upon you?—Yes; there are now 53 miles 1 furlong made wholly with granite, and 11 miles 7 furlongs partially so; and at the commencement of the Commission, there was a mile wholly made with granite, and about half a mile partially so.

208. Sir *William Jolliffe*.] If those roads were not repaired with or constructed of granite now, could this heavy traffic, which moves at an accelerated pace, move at that pace?—It could not in the winter season.

209. Mr. *Hildyard*.] And would that diminution of speed have a tendency in many cases to cause obstructions and blockades of the roads?—No doubt.

210. What in your opinion would be the general effect of throwing the whole of this district that is within your trust upon the suburban parishes?—The effect would be to greatly increase the highway rate in the parishes, and it would depend upon circumstances how far the parishes would repair the roads to the extent that we do; and if they did not do it in the same manner that we do, going to the same expense, the roads would become very bad.

211. In your judgment, the effect would probably be to increase the whole sum that would have to be paid by somebody or other in maintaining the roads, and would probably lead to the deterioration of the roads themselves?—Yes.

212. *Chairman*.] How do you make out that the sum would be increased?—In the increase of the parish rates; this must be derived from the parish rates.

213. You do not mean that it would not increase the expense of keeping up the roads?—No; I did not mean to imply that.

214. Mr. *Hildyard*.] Would it not tend to increase the whole sum expended if you had a separate staff in the several different parishes, all paid and employed for maintaining the roads in their own respective districts?—If they have a separate staff for it, it must be so.

H. Browse, Esq.

16 June 1856.

215. If the expense of maintaining the roads was cast upon the several parishes, do you not contemplate that each parish would have to employ its own staff?—Yes.

216. *Chairman.*] In your answer to the question of the Honourable Member for Whitehaven, did you mean the Committee to understand that you thought the maintenance of those roads would really cost more than it does at the present moment?—The repairing of the roads need not necessarily cost more, but if the parishes have not an establishment to conduct it they must have one, and so far as that is concerned it would cost more; but the repairing of the roads would not cost more.

217. Have the parishes or not such an establishment?—I presume that they all have an establishment, but I do not know whether they have sufficient.

218. Speaking of the more populous districts, such as Islington and Kensington, have they not a great number of miles of streets at the present moment to keep up?—Yes.

219. Is it not your opinion that pretty nearly the same staff would be sufficient to enable them to repair the roads thrown upon their hands, supposing the toll-gates were taken away?—By the new Act there is a separate Board of Works in each of those parishes, and an establishment attached which probably would be sufficient.

220. Would there not be this expense less, that they would not have to build or maintain toll-gates and side bars, or to pay any persons in those toll-gates and side bars to collect the toll?—Necessarily they would not have to do that, and a reduction has been made in the paper which I have handed in to that extent.

221. Mr. *Hildyard.*] You state that in the case of Chelsea, the application came from the parish; they were having a Local Improvements Act, and it was their proposal to take off that portion of the roads now thrown upon them?—Yes.

222. Have you ever had a similar application from any other parish, which you have refused to accede to?—No. There was an application from the parish of Hackney last year for the removal of the gates and the reduction of the toll; upon which the Commissioners replied that they were unable to do either, but if the parishes were prepared to take charge of the roads comprising the 15th district, and obtain an Act of Parliament for that purpose, the Commissioners would offer no opposition to it.

223. You have had no application from any parish to take the roads off your hands that you have not acceded to; and when you made the offer to the parish, in the case you have mentioned, they declined to avail themselves of it?—Yes.

224. Mr. *Butler.*] Was that on account of the great expense of obtaining an Act of Parliament?—I presume it was on account of the expense of maintaining the roads.

225. Is it the fact that the inhabitants of Hackney must pay two gates if they pass from any portion of the parish to a distance of a mile and a quarter?—There is one instance of that probably, but it is not the case in every part of the parish. Passing from Hackney and going to Kingsland, they would have to pass a gate in Dalston-lane, which is in the 15th district, and they would then have to pay the gate at Kingsland, if they went northward, which is at Kingsland; but they are two separate districts. They pass from the 15th to the 11th; but that would not apply in passing to London. If they paid the Dalston gate they would not pay the Kingsland gate.

226. *Chairman.*] Is it not the case that there is more than one parish in London which forms a part of two separate toll-paying districts?—Yes.

227. Therefore persons getting from one part of the parish to the other would be liable to pay two tolls?—Yes.

228. Is it not the case that the two roads in the parish of Kensington lie within a very short distance of each other?—Yes.

229. A gentleman who wishes to ride out from London, through Bayswater, and a little further, coming back by Hyde Park Corner, would have to pay two tolls, he going through separate districts, would he not?—Yes. In the case of the ninth district, a person might go to Highgate by one road and return by another,

another, and then go to Hampstead, and then go across from Regent's Park to Holloway, without paying more than one toll.

230. Sir *William Jolliffe.*] Is it your belief that if the toll-gates were done away with around the metropolis, a very considerable increase of accommodation, by omnibus traffic, would be afforded to the public?—They would probably go further, but I apprehend that they now go as far as they can get any receipt from passengers.

231. You stated that they stop when they are liable to be charged with toll; if the toll-gate were not there, would they not go much further?—No doubt of it.

232. Would there not be an increased traffic then upon those roads?—Yes.

233. Would there not be a still higher burden upon the maintenance of the roads than now exists?—Yes.

234. *Chairman.*] Would it not afford very much greater accommodation to the public?—Yes; if they went further there would be more accommodation.

235. Sir *William Jolliffe.*] They would be more accommodated, at a higher charge upon the parishes?—Yes.

236. There cannot be the least doubt the omnibuses would run much further into the country; they now stop because they have to pay tolls?—Yes.

237. Sir *John Shelley.*] Do the omnibuses make any alteration in the fares when gates are taken away?—I am not able to answer that question.

238. Sir *William Jolliffe.*] With regard to the improvements made upon these roads, there is a separate item in each year kept in the annual return, is there not?—Yes.

239. Have you any paper showing the improvements in various years?—The total amount of expenditure for new roads and improvements, since the Commission commenced, is 59,780*l.*

240. Colonel *Pennant.*] You stated that according to the estimate of the present year there would be no balance; does that estimate include any sum for the outlay for improvements during the present year?—It does not include anything for improvements.

241. Sir *William Jolliffe.*] There are certain improvements in progress, are there not?—There are two going on.

242. Will not there be a charge for those improvements?—In all probably there will be a charge of 400*l.* for one of them.

243. It has not been customary to put those charges into your estimate?—It has not.

244. Excluding the new roads, in what years were those improvements carried on to the largest extent; of late years, or in the early part?—More latterly.

245. Since a large proportion of the debt has been paid off?—Yes; since a large proportion of the debt has been paid off; the Commissioners have spent more money in improvements since the new roads were made; the new roads were made in 1830-31, and a specific sum was borrowed for that purpose, and there was but little done after 1835, till 1853, when some 7,000*l.* or 8,000*l.* was expended; in 1851, 900*l.* was expended; in 1853, 1854, and 1855, there has been a considerable expenditure.

246. Chiefly in straightening and widening the roads?—Yes.

247. Improvements do not include the formation of the roads with granite?—They do not.

248. Mr. *Hildyard.*] Having reference to the high rate paid for the smallest tenements, in a crowded metropolis like this, would not the effect of transferring the expense of maintaining the roads, from the tolls to a highway-rate, be to rate a great number of people to roads from which they derive but little benefit?—No doubt, if you put a rate upon the whole of the property, in every parish a vast portion of the inhabitants do not use the roads at all.

249. They neither ride in carriages nor or on horseback, and not frequently in omnibuses, and yet they would be rated?—Yes.

250. *Chairman.*] Do you not consider that the having good roads in a parish is a very great advantage, not only to those inhabitants who ride in carriages, but also to those who do not?—There cannot be a doubt that the means of communication is a great convenience for all parties.

H. Browse, Esq.

16 June 1856.

251. Is it not necessary for every house to have coals brought to it, and various other articles which cannot be carried upon men's backs; and is it not an advantage to them to have good roads for that purpose?—Certainly.

252. Would it not greatly increase the expense of those articles to those people, if the articles had to be drawn by two horses instead of one?—Yes.

253. The omnibuses and coal-waggons cause great wear and tear upon the roads, do they not?—Yes.

254. Do they only pay once, or do they pay every time?—Only once on the same day in the case of a waggon or cart; but the omnibuses pay every time they go through.

255. Would every cart that went through with a load of sand or building materials of any sort, have to pay each time going through?—No; they pass through a certain number of times for one toll; I think it is five times.

256. You have been asked whether you could give a separate account of the amount collected at each gate in the district, and the amount expended upon that district; I think you stated that there was no separate account for that purpose, so that you could not furnish it?—Yes.

257. Could you not furnish to the Committee, in addition to the account of the length of the road, and the cost of it through each district, an account of the amount collected at each gate in each parish?—We could not do so where the tolls are let; where they are in hand we could do it.

258. Two or three districts are let together sometimes, and sometimes one is let by itself?—The first and second districts are let together; the third, fourth, and fifth are let together; the sixth is let by itself; the seventh and eighth are let together; the ninth is let by itself.

259. Can you inform the Committee what the different districts have let for?—I think the last Return to Parliament will explain that.

260. Mr. *Butler*.] There can be no difficulty in getting at the amount for which you let each division?—Not the least.

261. Then there can be no difficulty in getting at the expenditure for the maintenance of the roads in that division; it will form a debtor and creditor account?—It is so stated in this Return, made to Parliament on the 23d of May last.

262. The other side of the account would show the cost of the maintenance of the roads?—It does so.

263. Will you read the items of the expenditure?—The first and second districts, which comprise the Kensington and Brentford roads, in the last year, was 15,427*l.* 7*s.* 10*d.*

264. That is given in one line?—Yes.

265. Is there any difficulty in giving the Committee a detailed account of the expenditure?—I do not presume that there would be any difficulty; it would take some time to do it. The total expenditure in those two districts amounts to 15,427 *l.* 7 *s.* 10 *d.*; they are put together. The receipt was 15,389 *l.* In the case of the third, fourth, and fifth districts, the receipt from toll was 9,392 *l.*; the expenditure was 9,395 *l.* In the sixth district the receipt from tolls and estates was 2,600 *l.*, and the expenditure was 3,300 *l.*

266. *Chairman.*] You have stated those figures from Paper 237, dated 23d of May 1856?—Yes.

267. Mr. *Butler*.] You stated that throwing the expense upon the parishes would increase the whole sum that would have to be paid by some one or other; are not the resident authorities as likely to maintain the roads as economically and efficiently as the present Commissioners?—There is no reason why they should not do so if they apply themselves properly to it.

268. *Chairman.*] You naturally, no doubt, are of opinion that the existence of these toll-bars in the middle of a crowded city is exceedingly objectionable?—There cannot be a doubt that the gate in the City-road ought not to have been there for the last 20 years.

269. You are obliged to multiply side-bars, and as you state the omnibuses stop there, and therefore there is a want of the accommodation which the public would receive if the toll-bar was removed, which they do not get; has it ever occurred to you that, supposing those toll-bars were removed from the district of the Metropolitan Local Management Act, how the roads ought to be kept up?—It does not strike me that there is any intermediate course between a turnpike-gate and parish rates. If the expenses are too great for the parochial

chial assessment, there is no other equitable and just method but by a turnpike-gate.

270. Applications have been frequently made to the Commission, have they not, to remove the gates altogether, and the answer has invariably been, "We shall be very happy to give them up if you will take them"?—There have been many rumours, but the only official application has been from Hackney. The parish of Islington last year petitioned the Board for a reduction of the toll, which took place; the Commissioners having then apparently a surplus, considered that as they could not remove the gate they should reduce the toll.

271. To the only official application that has been made, that has been the answer?—Yes.

272. The Commissioners have no interest in keeping the roads in their hands?—No; their object has been solely to benefit the public by their exertions, as far as they could; and if the parishes were prepared to take the roads, I think the Commissioners would offer no opposition to such a measure. The Act of the 7th of Geo. 4, imposes upon them the task of keeping the roads, and gives them authority to collect the revenue for that purpose. The object has been to limit the income to the expense necessary for repairing the roads.

273. Do you know the methods by which the parishes keep up the great thoroughfares, such as Oxford-street and Piccadilly; is it the same as that which is adopted by you?—Where the roads are paved, there is a difference; but in the case of macadamised roads, they apply the same means that we do.

274. Have you ever compared the expense which the parishes are put to with the expense that you are put to per mile?—No; I do not know that.

275. Sir *William Jolliffe*.] Have you not made a calculation in some instances, with regard to Regent-street, for example?—Having had to do with Regent-street, under the late Sir James Macadam, when it was macadamised, I have had access to the books, and I find that the expense of a mile in Regent-street, in 1840, was 3,400 *l*.; in 1842, it was 3,600 *l*. I am able to state the fact that the cost of maintaining the road over Westminster-bridge, which is let by contract by competition, is at the rate of 3,300 *l*. per mile; that is the yearly maintenance. I had the charge and care of that for the last 20 years, under Sir James Macadam.

276. Sir *John Shelley*.] There would be extra wear and tear there, would there not?—The water channels are paved, and the wheels are dragged upon them; the average wear of granite is 5 ¼ inches.

277. How is that as compared with Regent-street?—I could not obtain the detail exactly of the quantity in Regent-street at that time. The cost of a mile in the City-road is 2,300 *l*. The average wear of granite there is rather less than three inches.

278. Mr. *Hildyard*.] You have already stated that the cost of maintaining the 11 miles and 5 furlongs, which are within the bars, is 15,700 *l*.?—Yes.

279. That is less than 1,500 *l*. a mile?—It is rather less than 1,500 *l*. a mile.

280. You mentioned that the cost in Regent-street per mile, in one year, was 3,400 *l*., and in the next year 3,600 *l*.?—Yes.

281. Sir *John Shelley*.] At the time when the reduction of tolls took place, at Islington, was the subject of a general reduction of the tolls within the metropolitan district taken into consideration by the Commission?—The Commissioners have no funds to meet a general reduction.

282. At the time that the application was made from Islington, was the subject of a general reduction of the tolls taken into consideration by the Commission?—I think not.

283. A general reduction of the tolls has never been really considered by the Commission?—It has been spoken of by the Board, but no minutes have been made. It has been merely the subject of conversation.

284. Are the Committee to understand that the reduction which took place at Islington was in consequence of your having funds at that time, whereas in the case of other districts you had not funds, and consequently no reduction could take place?—It was because the Commission were in funds, and there had been no relief granted to that district by the removal of gates to the extent that it had been granted in other districts.

285. Mr. *Butler*.] In the year 1855 the toll at Hampstead was reduced from

H. Browse, Esq.

16 June 1856.

3 *d.* to 2 *d.*; had you in consideration a general reduction of the tolls at that time, or only a specific reduction?—It was considered that Hampstead should have the preference.

286. Why did you give Hampstead the preference?—Because the gate could not be removed. It is only 300 yards from the commencement of the Hampstead and Highgate Trust to Islington gate.

287. Sir *John Shelley.*] Can you state whether when the tolls were reduced at Islington, any additional accommodation in the shape of omnibus traffic was produced thereby?—I think not.

288. *Chairman.*] You stated that at the time when you made these calculations with regard to the mileage cost of Regent-street, it was under the management of Sir James Macadam?—It was under the Office of Woods and Forests, and Sir James Macadam was employed by them.

289. Since that time it has been given up to the parish?—It has.

290. What is the cost now?—I do not know.

291. Sir *William Jolliffe.*] You are the surveyor of the Surrey and Sussex roads, are you not?—Partly; there are two trusts.

292. Of which district are you surveyor?—The Kingston and Sutton.

293. In what year was that trust considered before the Committee of the House of Commons?—In 1849.

294. On the Kingston-road there was an alteration made in the position of the gates?—There was.

295. To what distance were the gates removed further from the metropolis than they then stood?—The Newington-gate at the Elephant and Castle was entirely abolished, and the roads were given up to the parishes from there to Vauxhall at the crossing of the South-Western Railway, and the two gates which stood at Vauxhall were parted; one was put in the South Lambeth, and the other in the Wandsworth-road.

296. Do you recollect the extent of road then made over to the parishes?—I think something like four or five miles.

297. That was arbitrarily done by the Committee before which the road was brought?—Yes; with a view of liquidating the debt of the Commission. They had a great debt, and while they were to keep up those roads, there was very little chance of their liquidating it; and to enable them to do so, those expensive parts of the roads were given up to the parishes.

298. And it was chiefly town district?—Yes.

299. Can you give the Committee any information as to the way in which those roads are maintained by the parish; are they in as good condition now as when they were maintained by the turnpike trusts?—I fear not.

300. That turnpike-road was a very heavily burthened trust, was it not?—It was.

301. If the trust had not maintained the road in a proper manner, the common law liability would have rendered the parish indictable?—Exactly so.

302. And with this heavy debt, and the impossibility of its liquidation as long as those important and expensive roads were kept by the trust, it was thought advisable that the parish should take a portion of those roads; they did not take the whole of the roads within the parish?—There was a very small portion in the parish at Newington and St. George's Southwark, and that was taken wholly. The road from the end of Blackman-street to the Elephant and Castle is divided in the centre, and falls to those two parishes; but the parishes of Lambeth and Camberwell had but a very small portion thrown upon them of what belonged to the trust.

303. The Committee of the House of Commons arranged that a certain portion of the road (half a mile) should be maintained by the trust before they came to the gate?—That is in the instances of the Camberwell-road and the Kennington-road; but there was no such stipulation as regarded the South Lambeth and Vauxhall roads. It was stated in evidence that they could not be protected if put more than half a mile away.

304. Is not it the case generally, that if a gate is put further away it becomes more difficult to protect it, and renders an additional number of side-bars necessary?—It depends upon the locality.

305. Mr. *Bonham Carter*] In the case which you have mentioned, the place was fixed at which the gates could be best put, and the trust commenced

100 yards

100 yards nearer?—In the case of the Kennington and Camberwell roads the gates remained where they were, and the trustees were to repair half a mile. In the case of the South Lambeth and Wandsworth roads the places were fixed for the gates, and that was about 300 yards from the commencement of the trust.

306. Sir *William Jolliffe.*] Though you say that these roads are not maintained in such good order as they were before, are they satisfactorily maintained?—There are sometimes complaints.

307. Are they maintained by the same material?—Not exactly; it is inferior in some parts.

308. The condition of the trust has very considerably amended, notwithstanding the removal of those gates, since that period?—The trustees were bound by their Act to apply 12½ per cent. of their income to the liquidation of the debt, and that they have done.

309. Have they been able to apply any more than that?—They have rather more.

310. Colonel *Pennant.*] One of the objects in removing the gate at Vauxhall-bridge was to give increased facility of access to the Vauxhall station of the South-Western Railway, was not it?—It was found that it could be evaded by passing over Vauxhall-bridge and going through the gate, and again along a side street and crossing the road.

311. That was the terminus of the South-Western Railway at that time, was not it?—Yes.

312. Sir *William Jolliffe.*] So that the traffic did not pass 100 yards over the road?—No; it was found to be only 97 yards that they used.

313. Mr. *Bonham Carter.*] What was the highest amount ever received from the tolls on those roads?—I think it will be found to be in 1837. In 1836 it was 79,600*l.*, in 1837 it was 83,497*l.*; that, I believe, will be found to be the highest amount of toll received.

314. Was it found that the increase per mile of outlay was very materially affected by the increase of traffic?—Yes; the expenditure increased somewhat in proportion to the increased amount of toll received.

315. From that period the tolls began to decrease?—From that period they began to decrease, and they are going down. They have been decreased from different causes. One has been that whenever the Commissioners have had apparently a surplus, they have removed a gate; and another cause has been an increased expenditure upon those roads from which the tolls have been removed.

316. What is the principal cause of the increased expenditure?—The increased traffic.

317. Can you state how much per mile the increase of outlay is now, compared to what it was at the two periods; the commencement of the roads in 1836 and 1837?—I can ascertain that; I am not prepared to answer it immediately.

318. *Chairman.*] Do you foresee that at any period not very remote from this time, the tolls are likely to be much reduced, supposing the toll-gates are kept up?—There should be an increase rather than a reduction, if the gates are maintained in the present position.

319. Do you see any chance of being able to maintain those roads at a smaller cost than they are maintained at at present, by which means the toll might be reduced?—It does not appear from the present estimate of the expenditure for this year, that they can be so reduced; but circumstances might occur that might render it less.

320. Do you foresee any circumstances that are likely to occur that could render it less?—At present, I do not.

Jovis, 19° *die Junii*, 1856.

MEMBERS PRESENT.

Lord Robert Grosvenor.	Mr. James MacGregor.
Mr. Hastings Russell.	Mr. Hildyard.
Mr. Wrightson.	Mr. Bonham Carter.
Sir William Jolliffe.	Colonel Pennant.
Mr. Alderman Challis.	Mr. Butler.
Sir John Shelley.	Mr. Wyvill.

LORD ROBERT GROSVENOR, IN THE CHAIR.

Henry Browse, Esq., called in; and further Examined.

H. Browse, Esq.
19 June 1856.

321. *Chairman.*] Is it not the fact that those tolls collected at the gates lying within the metropolitan district, in consequence of the immense number of diverging streets and lanes that intersect the district, are very extensively evaded?—In some of the districts very much so, more than in others.

322. But throughout the whole of the Metropolitan Board of Works districts that is the case, is it not?—To a considerable extent.

323. So that, in point of fact, if one was considering how the tax of the toll acted, one should say that it acted very unequally upon persons using the road with carts and carriages; that they sometimes may go a great distance entirely evading the toll, whereas others, only going a short distance, are compelled to pay one and even two tolls?—They are not so much compelled, but they do pay; where the evasion exists everyone can take advantage of it if they please.

324. Does not that depend upon the place where the man lives?—The evasion can be made use of by going a further or less distance to avail themselves of it.

325. A man who has business in the city, and who lives immediately on this side of Kensington turnpike, by way of illustration, having to go to the city and come back, will have to pay no toll, whereas a man on the other side will have to pay a toll every day?—Yes.

326. And the roads of both parties are equally kept up by the trust?—Yes.

327. The road is repaired from the Kensington Gate to Albert Gate?—Yes.

328. Sir *William Jolliffe.*] With respect to a person living on this side of the Kensington Gate coming to London without paying a toll, and a person on the other side having to pay a toll, the only remedy for that would be to remove the gate back again to the corner of Hyde Park?—Yes, that would be the only remedy, or to the end of the trust.

329. Does not that objection exist upon all turnpike trusts?—Of course it does. You only have to pay the toll when you go through the gate. If you go through the gate you must pay, and if you are going the contrary way you do not pay.

330. *Chairman.*] That is more forcibly brought into operation when there is a continuous street, in the middle of which the turnpike is placed?—That question does not apply to the fact of evasions.

331. In that instance the turnpike operates unequally, does not it?—Yes; but in that instance it would not be necessary. If he could go up the Palace New-road into the Uxbridge-road (living the other side of Kensington Gate) he would come into Tyburn and that part of the city free of toll, because he would pass along the Palace-road, and thereby avoid the gate. It is so stated here; but the explanation I have to offer to that is, that that Palace-road is not open to all carriages. There is a board and a porter at each end, and only carriages go that way that are going to and fro to the houses; it is not public for all traffic.

332. Mr. *James MacGregor.*] Would not the value of the house property upon the two sides of the gate be affected by the charge?—Most probably that would be the case; it would be a matter of consideration in taking a house.

333. Mr. Alderman *Challis.*] What is the amount of toll at the Kensington Gate?—Three pence per horse, and 1½ *d.* for a saddle horse.

334. Colonel *Pennant.*] I understood you the other day to state that the tolls are levied according to the districts?—Yes.

335. A person who had paid a toll in one district happening to pass into another, would pay a second toll, would he not, although the distance might not be great?—Yes.

336. Have you ever considered the subject with reference to the enlargement of the area of clearance without reference to the different districts?—Yes. Between the 13th and 14th districts the gates clear each other; and in considering the subject of clearance, I am of opinion that that could not be carried out without a considerable loss of income; but that is not so great an object as the prevention of the fraud that would arise. People going out a mile or two with a cart, and paying in one district, knowing that the ticket would free another, would be very likely, when they returned, to give the ticket to their neighbour, who would go upon the other district also; and all those districts that cleared each other must be let together.

337. Are you not equally liable to that fraud at the present moment?—A man returning along the same road would very likely be fixed; they would very probably dispute any man bringing back the ticket, except the man they gave it to; whereas, if he went on to another district, he would have another man to contend with, who would not know him.

338. Could not you in that case make them one district?—Yes, they might be made one, and let together.

339. You think that in consequence of there being two different roads, and the liability of giving the ticket to a person coming back by another road, it would not be possible to enlarge the area?—It would be possible, but I think it would be a great sacrifice, and it would be liable to some difficulties.

340. Would it not give considerable relief?—It would give relief to the immediate neighbourhood of London if certain districts were so altered. If the first and third were made to clear each other, it would relieve the inhabitants of Kensington and Notting Hill to some considerable extent; and probably the 11th and 15th might be made to clear each other; but in both cases there would be a considerable reduction of income, and those districts would have to be let together.

341. *Chairman.*] You know the line that the goods traffic takes between the Euston Station and the Camden Station?—I do.

342. There is a gate in the direct line, is there not?—The nearest route would be through the gate; but it is a very trifling distance; the traffic merely crosses the road.

343. It does not take the most direct route but it does go over a portion of the route, and through a portion of the parish road?—I am not prepared to say that it is not as direct as the other.

344. That traffic, which is very heavy indeed, does not pay the toll at all?—No.

345. Have the contractors at any time made an attempt to induce that traffic to go through the gate by taking only one toll a day?—I believe it is a fact (I have heard so) that certain omnibuses do pay but one toll a day, under the threat that if that is not taken they will go by the side road, which runs parallel with ours.

346. The same remark applies a good deal to Pancras Gate, does not it?—Similarly.

347. Mr. *Wrightson.*] Can you give the Committee an opinion as to what additional distance parties wishing to avoid these tolls travel one with another; is it half a mile on the average, or a mile?—Many people go a mile, and others would not think it worth while to go 200 yards.

348. Mr. Alderman *Challis.*] How far are they obliged to go?—In some places not a furlong; and in others half a mile.

349. Mr. *Butler.*] You find that they go half a mile?—A mile occasionally.

350. Men having money given to them by their masters for the payment of

H. Browse, Esq.

19 June 1856.

the toll evade the toll, and defraud their masters; they cheat the tolls, and wear their masters' horses out by travelling over bad roads?—If the masters give money to their servants indiscriminately to pay the toll, without requiring them to produce the turnpike ticket, they rob the masters; but I presume that the master takes care to see the ticket, and there is a date put upon it.

351. Is that always the custom?—It is so established by law, and it must be done.

352. The roads are frequently broken up by the repairs of sewers, are they not?—Yes.

353. You have an account with the Metropolitan Commission?—We have.

354. The control of the main sewers is with the Metropolitan Board of Works?—It is.

355. Do you not think that the maintenance of the roads might be advantageously placed under the charge of that Board, Parliament at the same time giving that Board powers to rate the several parishes equitably for the maintenance of the roads?—I think they might be so maintained.

356. Would you prefer that mode of dealing with the question to throwing the maintenance of the road on the district Board of Works?—I think that probably it would be a more equitable arrangement in a great thoroughfare.

357. Mr. Alderman *Challis.*] How would it be more equitable?—The general Board would levy a rate over the whole extent of its limits, whereas the local Board would have to levy it upon the immediate parish. In some parishes it presses very heavy, while in others it is very light.

358. Do you believe that those parishes where very little traffic goes over their road would not feel it a very great injustice to be obliged to pay for the large traffic over another part of the road?—Probably they are in the habit of using a road going through a smaller one; the parish of Islington have a very small portion of the City-road, but they use a large portion in the parish of St. Luke's.

359. Mr. *Butler.*] You answered to Question 181, that 11 miles and 5 furlongs which you maintain, are maintained to a certain extent out of the tolls taken in the parish of Hackney; is not that an injustice; one part of the district has to pay for the maintenance of a road in another?—There is no greater injustice there than exists in all cases where the gates are not at the end of the trust. The parish of Hackney proceed to London every day over that portion of the Hackney district in Bethnal Green parish and Shoreditch parish.

360. But they have to pay the toll?—Yes.

361. Is the watering of the roads in all cases performed by contract?—It is.

362. Are the whole of the roads watered?—Mostly so; not quite all.

363. Can you make any statement to the Committee upon that subject?—There appear to be 102 miles of road now watered out of the 120.

364. Are you aware that the inhabitants of your division of Hackney, in which you stated there were three turnpikes, were compelled to subscribe together to water their roads four years ago?—I believe they have not generally watered the parish roads till this year.

365. I speak of your roads?—No part of the trust roads have been watered by private individuals; certainly not for the last 10 years.

366. Are you quite sure that your remark applies to the Upper Clapton division of the Hackney district?—Yes; it is wholly watered by the Commissioners at the present moment.

367. Were those roads watered three or four years since in that way?—At all events for the last five years, and, I fancy, very much longer.

368. Sir *William Jolliffe.*] The watering of the roads has been very much extended within the last five years; you did not so extensively water the roads till after the debt was paid off as you now do?—No.

369. Mr. *Butler.*] Are you aware that the inhabitants of your division of the parish of Hackney were compelled to subscribe in order to their roads being watered, in consequence of the refusal of the Commissioners to perform that work?—The Commissioners discontinued the watering of a small portion of Upper Clapton for three or four years, and during that time a portion of it was watered by the inhabitants.

370. Can those inhabitants get to the City without paying tolls?—No.

371. They provided the watering, and paid the tolls?—Yes, during that time.

372. Sir

372. Sir *John Shelley.*] To recall your attention to an answer which you gave just now, as to the question of the expense of maintaining the roads being put under the Metropolitan Board of Works instead of under district Boards, I understood you to say that it would be more equitable that the expense of those roads should be put under the Metropolitan Board of Works; are you aware of the case of St. Margaret's parish having an outlying district which would have a mile and a quarter thrown upon it, it deriving no benefit from the removal of the toll; and in the answer that you gave to the question, was St. Margaret's parish in your mind at that moment; that instead of throwing that expense upon the individual parish, it should be borne by the whole of the parish?—Yes, it was with reference to that fact, as well as St. Luke's. The parish of St. Margaret's and St. John's derive no benefit whatever from the toll.

373. *Chairman.*] The distance is stated to be seven furlongs and 16 yards?—Yes; I believe the parish goes considerably further, but we have a difficulty in ascertaining whether the district beyond would be in St. Margaret's or Kensington.

374. Sir *John Shelley.*] It may be more than seven furlongs?—It may be so.

375. Mr. *Butler.*] The difficulty raised would cease from the circumstance of the Metropolitan Board of Works having the power to rate equitably?—Yes.

376. Mr. Alderman *Challis.*] You stated just now that 102 miles out of 120 were watered; are the whole 120 charged with watering the 102?—There is no express toll for watering.

377. Those parts of the district which were not watered paid for those which were watered?—Yes.

378. Mr. *Hildyard.*] Since your debt was diminished, you have watered to a much greater extent than before; have you also been incurring a large expense by employing scavengers in removing filth from the streets?—Yes.

379. To what extent?—The expense of cleansing the roads and carrying away the filth in the London districts, which is let by contract annually, for the four years from 1852, has cost the Commissioners 5,600 *l.* more than it would if the price had continued as it was in 1851-52; and it arises in consequence of the alteration of the contract, that they should remove it within 24 hours, instead of removing it within 48 hours.

380. You gave in a paper to the Committee when you were last examined, which shows that the expense that has resulted to the parish of Chelsea, from taking the roads upon its own hands, amounts to a rate of 1 *d.* in the pound; that is accurate, I imagine?—No; that is the cost of a piece of road in that parish which the Commissioners maintain, to the extent of a mile and 198 yards.

381. Is an expense still cast upon the Commission of 850 *l.* per annum, amounting to a rate of 1 *d.* in the pound?—Yes.

382. Do you know what addition has accrued to the rates of that parish, from taking their roads upon them?—I do not know.

383. How many gates were there in the parish of Chelsea?—Two gates and two side-bars.

384. Sir *William Jolliffe.*] How is the water obtained by which you now water the roads?—Much of it is obtained from the different companies, and it has been increased during the last five years to the extent of 350 *l.* per annum; the Commissioners now pay that much more than they did five years ago for water for the several roads. Instead of taking it from where the sources hitherto were, namely, from the sewers, wells were dug by the side of the sewers, and the water was very offensive. Part of the increase is for the roads that have been extended, and that were not watered before; and that has been done greatly on sanitary grounds, as well as the cleansing of the road.

385. Did you state in your evidence the other day the amount that it had cost the trust to extend the granite?—In the year 1854, it cost 2,600 *l.*

386. What has been the average cost of improvements during the last five years since the extinction of the gate?—Since the extinction of the debt it is 4,800 *l.*

387. Sir *John Shelley.*] Have the water companies made any increase in their rates of supplying you with water?—The New River Company have done so.

H. Browse, Esq.

19 June 1856.

388. To what extent have they increased the rate?—One-sixth.

389. When was that increase made?—Only for this year.

390. Mr. *Butler.*] You are aware that the New River Company filter their water now?—Yes.

391. They did not do so before?—They did not.

392. Then you have a better class of water than you had before?—Yes.

393. Sir *John Shelley.*] Is there any benefit in watering roads with filtered water over any other water?—It is much more comfortable to people passing along the roads.

394. It is stated that the water now being filtered, the company ask you more for it; is there any advantage in the water being filtered, as against sewer water?—I do not consider that that was the plea; it was in consequence of the great outlay to which they had been put.

395. Mr. *Butler.*] In what manner do you pay?—At per mile, except in the case of Chelsea, and that is at per square yard, because the road is much wider at some parts.

396. Sir *William Jolliffe.*] You were asked at Question 133, "Are any of the trusts in debt?" to which you replied, "Separately they are." I do not think that that explains exactly the state of the case; will you explain it more fully?—The books will show which they are; the Kilburn and Edgware-road is one.

397. When you say that they are in debt, you mean that there is a balance against those roads upon the general fund; is that the case?—That is the case.

398. With regard to the other roads nearest the metropolis, the Old Kent-road and the Surrey and Sussex roads, those are the nearest roads?—The Mile End-road and the Commercial-road are near the metropolis.

399. Mr. *Butler.*] Those are not under your trust?—They are not.

400. Sir *William Jolliffe.*] Are the tolls higher on those roads than on the metropolis roads?—Yes, in every case. The Surrey side charge an extra half-penny for watering, which we do not; and the tolls on the Mile End Trust and the Commercial-road are both higher than ours.

401. Are the gates as near to London as the gates in the metropolis roads?—In every case they are much nearer.

402. Mr. *Bonham Carter.*] Is there any provision in the Acts of Parliament with reference to the other side of the water for removing the gates further off?—I do not know that there is any special provision in their local Acts; but the General Turnpike Act gives them power at all times to remove them.

403. Colonel *Pennant.*] You spoke of the tolls on those other trusts being higher than the tolls on the Commissioners' roads; are those extensive trusts?—The Surrey and Sussex are very extensive; upwards of 60 miles. The New Cross Trust is 40 miles.

404. Do the gates upon the different roads clear each other?—To a certain extent; somewhat similar to the metropolis roads.

405. Do they suffer from this evasion of toll which you anticipate will take place if you extend the area of your clearance?—They are liable to evasions similar to our gates.

406. Are you aware whether those trusts comprise two different roads leading towards London, and do the gates upon one road in that trust clear any upon the other road?—Yes, they do.

407. Do they suffer from that evasion which you anticipate would take place, if you extended the area of your clearance?—I have no doubt that they do occasionally.

408. Mr. *Butler.*] You have stated that the tolls in the Mile End division and the Commercial-road are higher than any of the tolls in the metropolitan trust; are you aware that they have recently paid off a very large debt on the Essex roads, and that they took away the gate nearest to London?—They took away the gate at Whitechapel road some years ago; and they now maintain the road only a quarter of a mile on the London side of the gate.

409. The Commercial-road trust to which you have referred, is a proprietary trust, is not it?—Yes.

410. They purchased the land, and formed the road?—Yes.

411. That proprietory trust is still in existence?—It is.

412. The tolls would be very much reduced when that amount is paid off?—They have a very heavy debt, bordering upon 100,000 *l.*, at present.

413. Mr.

413. Mr. *Bonham Carter*.] Referring to the map which has been laid before the Committee, the red crosses represent the present gates?—Yes.

414. Are the side-bars indicated?—No.

415. What is the minimum distance which you charge?—Seven miles, if you go straight on in a district.

416. Referring to the Highgate and Hampstead-road, which is coloured brown, are there three gates: Islington, Pancras Old-road, and Camden Town?—There are.

417. A person passing through those three gates from the city would clear the three gates, which appear to be upon an average about a mile beyond?—The payment of either one of the gates between Hampstead and Highgate, clears all the others.

418. Supposing the three gates nearest London were abolished, a certain portion of the traffic would be caught at those three gates which now passes through after having paid once?—Yes.

419. Can you give approximately any idea of what proportion you would lose?—I think one-third of the income.

420. You mean two-thirds of the receipts from those three gates?—From the whole receipts of the district.

421. I understood you to say, that if the three gates nearest London were abolished, two-thirds of the whole receipts upon that trust, coloured brown, would be lost?—That is the nearest estimate that I can form.

422. Can you give the Committee any grounds upon which you form that estimate?—No further than from the great receipt from omnibus traffic passing through those gates which do not go through the others, and from the local traffic, such as coals and various other things.

423. Your opinion that the abolition of the three gates would cause that great loss is founded principally on the loss of omnibus traffic; do you form that opinion only from your own impression as to the omnibus traffic, or from communication with persons who have had gates?—From my own impression.

424. Is it possible to arrive at a more accurate result from any statistics that could be laid before the Committee?—Not till the Commissioners have collected the tolls for a year; then we shall probably be able to arrive at a more accurate account.

425. *Chairman*.] You stated the other day that when a gate was removed from one place to another, the expense of maintaining the road between the place where the old gate stood and the place where the new gate is put down is increased, because the omnibuses which stopped previously at the former gate go on to the other?—Generally that is the case.

426. You stated that you thought that the wear and tear of the part of the road furthest from London would be about the same as what it was on the London side of the old gate?—It would be increased to the same, or thereabouts.

427. The omnibuses for the last half mile load very much lighter, do they not?—Probably they may.

428. Neither in point of weight or in speed are they the same?—Perhaps not.

429. What is the extent of the Harrow-road district, the sixth district?—Nine miles and two furlongs.

430. What is the expense of maintaining that road?—The expense of keeping the road, exclusive of improvements, is about 2,300 *l.* per annum.

431. It is stated in the 26th Report, that the debt upon that road was wholly paid off in that year; that was, I think, in the year 1852 or 1853, and at that time the toll-gate was removed further from London, and the toll was diminished?—It was so.

432. Why was it that the Commissioners did not remove the toll bar there entirely, inasmuch as the trust property more than sufficed to maintain the road?—I am not aware that the trust property ever amounted to enough to repair the road; it is 2,300 *l.* per annum.

433. The amount of the trust property is stated to be 3,400 *l.*?—That is the whole of the trust estate, and is applicable to the Edgware-road as well; the greater portion is applicable to the Edgware-road.

James Wittit Lyon, Esq., called in; and Examined.

J. W. Lyon, Esq.

19 June 1856.

434. *Chairman.*] IS the Lyon Estate applicable to the repair of the whole of the Harrow-road district?—Yes. Parliament has divided these rents, giving a portion to the parish of Marylebone, and a portion to the parish of Paddington; and although the rental is what your Lordship has stated, 4–16ths of the rental go to Marylebone and 3–16ths to Paddington.

435. In answer to Question 719, of the Metropolitan Communications Committee, you state that 1–16th goes to the parish of Marylebone, and 1–16th to the parish of Paddington?—It may be so.

436. Is that correct?—The Acts of Parliament with reference to that matter, can be laid before the Committee, but with the permission of the Committee I will read an extract from one of the Acts: "And be it further enacted, That the said Commissioners shall from time to time, as and when they shall receive the same, pay to the vestry of the said parish of Paddington, or as they shall direct, one equal eleventh part of the clear yearly rents and profits which shall arise from the lands and hereditaments conveyed by the said indenture of the 19th day of December, in the 25th year of the reign of Queen Elizabeth, from and after the said 1st day of January next, and the said one-eleventh part of the said rents and profits shall be applied by the said vestry in or towards the repairing, improving, watching, watering, and lighting of so much of the road from London to Harrow as lies between the south side of Chapel-street aforesaid, and the first carriage bridge over the Grand Junction Canal, on the Harrow-road; and that the said Commissioners shall pay to the vestrymen of the parish of St. Marylebone, or as they shall direct, three equal twentieth parts of the said last-mentioned rents and profits, to be by the said last-mentioned vestrymen applied in or towards the repairing, improving, watching, watering, and lighting of so much of the road from St. Giles's Pound to Harrow-on-the-Hill as, under the provisions herein-before contained, will be maintained and repaired by the said parish of St. Marylebone; and that the said Commissioners shall also pay to the said vestry of the parish of Paddington, or as they shall direct, two equal thirty-ninth parts of the clear yearly rents and profits which shall arise from the lands and hereditaments conveyed by the said indenture of the 6th day of July, in the 21st year of Queen Elizabeth, and be received by the said Commissioners after the said 1st day of January next, to be by the said vestry applied in or towards the repairing, improving, watching, watering, and lighting of so much of the road from St. Giles's Pound to Edgeware as, under the provisions hereinbefore contained, will be repaired and maintained by the said parish of Paddington; and shall also pay to the said vestrymen of the parish of St. Marylebone, or as they shall direct, seven equal thirty-ninth parts of the said last-mentioned clear yearly rents and profits, to be by the said last-mentioned vestrymen applied in or towards the repairing, improving, watching, watering, and lighting of so much of the said road from St. Giles's Pound to Edgeware as, under the provisions herein-before contained, will be maintained and repaired by the said last-mentioned parish; and the said Commissioners shall apply the residue of the clear yearly rents and profits which shall arise from the lands and hereditaments conveyed by the said indenture of the 19th day of December, in the 25th year of the reign of Queen Elizabeth, towards the repairing and improving of the roads comprised in the sixth district hereinafter described; and shall apply the residue of the clear yearly rents and profits which shall arise from the lands and hereditaments conveyed by the said indenture of the 6th day of July, in the 21st year of the reign of Queen Elizabeth, in the first place, towards the repairing and improving of the roads comprised in the seventh and eighth districts hereinafter described, and, subject thereto, in or towards the repairing and improving of the roads comprised in the said sixth district." There are two estates of John Lyon. The proportions to be applied to the parish of Paddington are also defined by the same Act of Parliament; but whether it be 1–16th or not, there are certain proportions which go to each parish, and that is defined by Parliament. The Commissioners therefore hand that portion over to them for the maintenance of that part of the road.

Directing certain payments of the rents of John Lyon's estates to the parishes of Paddington and Marylebone.

437. Supposing the expense of maintaining these roads should ever fall short of the amount of Lyon's Trust appropriated to that purpose, the surplus will go

go to Harrow School?—Assuming that there was a surplus beyond the maintenance of that road, it would go to Harrow School.

438. Is that amount of property which you stated Parliament gave to the parishes of Marylebone and Paddington the whole amount of Lyon's property that is expended upon those roads?—No, it is only certain lands given by particular deeds; the rest of the property is given to the school at Harrow.

439. Then this road is repaired out of certain specified lands, is not it?—Yes, out of certain specified lands.

440. Supposing the tolls were entirely taken away, would that amount of money which you have stated still be paid to those two parishes, or would it be paid to the repair of the whole Edgeware and Harrow district?—Supposing that the turnpike-gates could be removed to-morrow, that proportion would be paid to those parishes in perpetuity.

441. Those roads in those parishes could not be thrown upon the parishes, except you alter the trust of Lyon's will?—Except you alter the trust of Lyon's will and various Acts of Parliament which have confirmed it, passed by the governors of the present Harrow School. Perhaps the Committee will allow me to explain, that on looking to the terms of the Act of Parliament, I do not think the surplus rents of John Lyon's estate go to Harrow School. I was confounding it at that moment with Harvist's estate.

442. I ask the question, because you gave different evidence before the Metropolitan Communications Committee?—I was called upon perfectly unexpectedly to give evidence before the Metropolitan Communications Committee, and speaking from memory, I may have stated that which was not correct; but I am not aware that I said so.

443. (To Mr. *Browse*.) The commissioners have spent some money upon the improvement of that Harrow-road?—They have.

444. Can you state what amount?—£. 4,614.

445. The traffic of that road where the improvements have been made is very small, is not it?—It is as much as it ever was; it is agricultural and local traffic chiefly. Nothing has affected that road particularly.

446. Any repairs which you make upon that road is so much taken away from Harrow School; is not that the case?—Yes.

447. Sir *William Jolliffe*.] It has been stated that this money was left by Mr. Lyon, because he thought that it was as desirable to make a road to his school as to endow the school?—The noble Lord in the chair stated that fact himself.

448. Was not the road before these improvements were made very narrow in parts?—Very; and very objectionably so; it was very dangerous.

449. And very crooked?—Yes, very crooked.

450. *Chairman*.] It was stated that supposing these roads were thrown upon the parishes, Paddington would have three miles, two furlongs, and sixty-four yards, which would cost 2,940 *l*.; how much of that Harrow-road is in Paddington parish?—About a mile.

451. Sir *John Shelley*.] With reference to St. Margaret and St. John's, there is a dispute as to the distance?—We take it that the road is in the parish as far as Kensington Gore, but we are aware that the parish does extend on the north side of the road up to the King's Arms in Kensington. Our impression has been that part of the road is in Kensington parish.

452. Is there then a dispute about any other in this return?—Not that I am aware of.

453. *Chairman*.] In the reports which are presented to Parliament, there is no separate account of the receipts and expenditure of the trust money, is there?—No.

454. Mr. *James MacGregor*.] You have put in a paper showing the length and the estimated cost of the metropolitan roads in the several parishes within the limits of the metropolitan local management, and also beyond the limits; are you able to show what rate is levied in each of those parishes on the assessment to the poor-rate for highway rates maintained in the parishes?—I have partially obtained that, but not wholly; and I have inserted it in one of the printed forms which I can read with the permission of the Committee.

455. Do you happen to know the rate in Kensington?—Fourpence halfpenny.

456. And what is your charge?—Fourpence three farthings.

457. What is it in Hammersmith?—Eight pence.

 458. What

J. W. Lyon, Esq.

19 June 1856.

458. What is your charge?—One shilling and three halfpence.

459. What is it in the parish of Hendon?—It is returned at ten pence.

460. And your outlay is how much?—Three-pence halfpenny.

461. If the roads were handed over to the respective parishes, your estimated rate in the pound would be in addition to the assessment levied for maintaining the roads in those parishes?—It would.

462. Mr. *Butler.*] Is the rate in the pound in the fifth column made on the assumption that the present expenditure for staff and maintenance is to be continued?—It is not; the amount stated in the third column, which is the estimated cost of those roads, is exclusive of any establishment charges, or for the repair and maintenance and upholding the turnpike-gates and the collections.

463. The rate in the pound is made upon the cost?—Yes, the absolute cost according to the assessment of the present poor rate, which is the best information that I have been able to obtain.

464. Do you assess the parishes equally when a road passes through two parishes?—According to the amount spent in the parish, and according to their assessment to the poor rate.

Vincent Charles Wright, Esq., called in; and Examined.

V. C. Wright, Esq.

465. *Chairman.*] YOU are the Accountant to the Metropolis Roads Commission, are you not?—Yes.

466. Are you able to furnish to the Committee an account of the amounts received from the trust estates belonging to the commission, and the manner in which that has been expended, for the last five years?—Yes, I will do so.

467. Mr. *Hildyard.*] What rate of interest did the Metropolis Roads pay when they had a debt?—Four per cent. for a loan which they contracted for the purpose of paying off the embarrassments which had been handed over to them by the trustees, consisting of a bonded debt and other matters, at various rates of interest, from 4 and 5 per cent. up to 10 and 12 per cent., by way of annuities. Those were got rid of as soon as possible, the Commissioners contracting a debt for which they paid 4 per cent.; the whole of that debt has been discharged.

468. The separate trust out of which this Commission was originally formed having raised money at a very much higher rate?—Yes.

469. Mr. *Butler.*] Can you furnish the Committee with a statement of the expenditure in each district in respect of the collection of the tolls for the maintenance of the toll-gates, the side-bars, and the wages for keeping up those gates?—I do not think I could, because the money which is carried to the credit of the roads consists of the net amount received from tolls, and the expenditure recorded is for general outlay, for the purpose of the repairs of the roads, and other purposes connected with them. I am not aware that we could state what each particular bar costs us; it might be found out, but there is no specific entry of that.

470. You have an account to show the cost of the maintenance of the roads?—Yes.

471. All beyond the actual cost of maintenance must be for collection?—It is difficult to identify it; we receive the net sum from the gates, not the gross sum, and then paying the wages.

472. I am speaking of the cost of maintaining the road?—Yes, those of course we have.

473. *Chairman.*] Had you no districts in hand last year?—Yes, we had.

474. Can you give the Committee an account of the cost of collection and the maintenance of a road for the last year, distinguishing those two heads?—Yes, as far as those tolls are concerned which we have in hand, we could do so.

475. Will you furnish a return of that description to the Committee?—I will do so.

476. Sir *John Shelley.*] What is required is a complete debtor and creditor account?—From our toll tickets we could get at the wages that are paid to the men, and the sum which they pay over to us, which goes to the maintenance of the roads; they pay over the net sum.

477. In the case where the Commissioners do the whole thing, receiving everything that is to be received, and paying everything that is to be paid, there must be a regular debtor and creditor account kept; could not that account be furnished to the Committee?—It can be got at; but we do not keep an account in that form. Certain sums are collected, from which the wages are deducted, and the net sums are paid over to us by the collector.

478. Who makes that deduction of the wages; how is that tested?—The collector makes the deduction himself, sending in a ticket of his gross collection, so much deducted for tickets, and so much net paid to us.

479. In what way do you arrive at the knowledge, to the satisfaction of the Commission, that the proper deduction is made?—We have a superintendent of tolls, whose duty it is to receive the tickets, to place proper men at the gates and bars, and satisfy himself that we are honestly dealt with.

480. Does not that superintendent keep an account that is laid before the Commission, which they can test?—He enters in his book the net collection, free of wages and deductions, returning us the tickets containing the gross amount and the deductions as well.

481. What means have you for checking the deductions that he makes for wages; you do not trust the superintendent, do you, without any check?—We have the actual tickets that are returned by the men.

482. As having been received for wages?—Yes, daily. Supposing a collector receives a gross toll of 5*l.* 4*s.* for the day, and his wages are 4*s.*, he would deduct the 4*s.* from the 5*l.* 4*s.*, handing over the 5*l.* to the superintendent.

483. Mr. *Bonham Carter.*] In that case you know what the wages are, and knowing the number of collectors, and what wages are due to them, you could easily state the amount?—Yes.

484. Sir *John Shelley.*] There is no other deduction made when the toll is paid over to the Commission, except the wages that the men receive?—There is no other deduction.

485. Will you furnish a debtor and creditor account of the receipts and expenditure of each district that the Commission have in hand, during five years?—Yes.

486. Colonel *Pennant.*] Without reference to collection, supposing the gates were discontinued and the roads thrown upon the parishes, and supposing the parishes had separate staffs, which I believe they have, the whole cost to the parish would be the actual repair and maintenance of the road?—That would depend upon circumstances; if their staff were only sufficiently strong to carry out their own duties, of course an extra portion of road would require an extra staff, or the former staff would be overtaxed.

487. With regard to the parishes requiring an additional staff, assuming that those parishes have a staff of superintendents at this moment, would not that additional staff consist of the workmen, the labourers employed in the repair of the roads?—That would depend very much upon circumstances. There is no doubt that direction might be extended over many more men than at present, without requiring an additional superintendent.

488. Then the addition would be merely the expense of the labourers upon the road?—I do not think it necessarily follows that it would be confined to that.

489. Supposing them to have already a staff of superintendents, what other people besides labourers would be required?—I do not know that I could take a better case than my own: supposing the duties of my office were increased two-fold, I apprehend I should require some more assistance than I have at this moment.

490. The expense of labourers is included in the return that has been made to the Committee?—Yes.

491. Mr. *Hildyard.*] Do you use the Guernsey granite for the purpose of repairing the roads?—Yes, by preference.

492. Is it within your knowledge whether the metropolitan trust imports it itself, or does it buy it at the wharfs here?—It purchases by contract; tenders are sent in for the requisite supply, and the lowest tender from a sufficiently respectable party, who is known to be capable of fulfilling his engagement, is accepted.

493. Do you think that a body like the metropolitan trust can contract with more economy for a large mass of granite than several parishes would be able

V. C. Wright, Esq.

19 June 1856.

to contract individually?—There can be no question about it; because it was found in the case of the separate trusts which is almost parallel to the parishes, that they were competitors against each other in the market; when Highgate wanted granite, and Stamford-hill wanted granite, they were competing with each other who should get the quantity on hand.

494. Can a body like the metropolitan trust, water the extent of the roads under its control with a fewer number of horses and water-carts than could be done by all those parishes separately?—Naturally; because they would take certain lengths of road without regard to the parishes.

495. Would the same remark be applicable to tools; do you think that such a body could purchase tools for the general purposes of the trust, and employ them with more advantage than the several parishes could do?—I think the advantage of an aggregate body would be carried through every branch, materials, tools, labour, and so on.

496. *Chairman.*] Are you not assuming that those parishes have no other roads to water or to deal with, than the small piece of road in comparison with the road now maintained by the Metropolis Roads Commission which passes through the parishes?—No; I am assuming that their operations were confined to such portion of the road as might be additionally thrown upon them.

497. Do not all those parishes manage an enormou sextent of road, in comparison with which the road that would be thrown upon them is a mere nothing?—Yes; but I am not aware that they are managing their affairs, even upon a large scale, more advantageously than we do.

498. Mr. Alderman *Challis.*] Upon the subject of checks, what security have you, as those parties merely send back the tickets, that you get the whole of the money, when we know that one-third of the parties passing through the City-road gate never take a ticket at all?—The answer to that question would be more readily given by the party having the care of the tolls.

499. Who is that?—Whenever we have any tolls on hand an officer is appointed, whose duty it is to superintend them, and give a considerable portion of his attention to them; he goes round to the gates to see that proper men are appointed.

500. Are any means taken to test the fidelity or honesty of those men?—I presume so.—(Mr. *Browse.*) There can be no check of that kind against turnpike-gatemen but by comparison; we select the best men, whom we feel that we can trust. Then there is the comparison of every day against the corresponding day, and the man is upon his good behaviour if he does not bring so much money. And occasionally the toll manager stands at the gate for a considerable number of hours, or sends somebody in whom he can confide to watch the gate to a certain extent; but it must depend upon the honesty of the men; that is so also with the lessees.

501. Do you not endeavour, as much as you can, to follow the same track that the lessees of the tolls do themselves?—We endeavour, as much as we can, in every case to get as much money as we can; and if we thought that there was a better mode than that which the lessees adopt, we should adopt it.

502. Mr. *Butler.*] Have you tried every expedient to make them honest, and have you found it impossible to do so?—I would not wish to say that; it would be casting a slur upon a very large body of men.

503. (To Mr. *Wright.*) You stated that the only check which you had upon the receipts was the tickets?—Yes.

504. The Honourable Member asked whether there was any means of checking the persons passing through, who do not take a ticket at all?—By having a man posted at the gate. We had men posted at the gate for the purpose of taking the traffic years ago, when we had large tolls on hand.—(Mr. *Browse.*) The ticket to which the Honourable Member alludes, is the ticket given by the turnpike man. The ticket alluded to by the accountant is a cash note, upon which every man, when he has done his duty at the gate, puts down that he has received so much money, and his wages so much; he hands that over, together with the net cash, to the toll manager, who weekly returns them to the office. He sends in a bundle of tickets amounting to so much money with the cash. The accountant therefore has only the cash note and the money handed to him.

505. In fact it is a question of the honesty of the collector?—To the extent that I have explained, it is.

506. Mr. *Butler.*] (To Mr. *Wright.*) The accounts of the commission are audited; are they not?—Yes.

507. By whom are they audited?—By the Board at the General Commission.

508. Are they generally the same Commissioners who audit the accounts?—Yes.

509. Is it a yearly audit?—Yes.

510. Sir *John Shelley.*] There are no auditors appointed?—No formal auditors. The accounts are audited by the Commissioners themselves. Those accounts go to Parliament, which subjects them to additional scrutiny.

511. Mr. *Butler.*] How often do the Commissioners meet?—About once a month on the average. We expect a meeting every four weeks, but oftener if business requires it.

512. Are they generally the same Commissioners who attend?—No, they vary.

513. How many generally attend?—It is difficult to give an average; I have known an instance of 13 or more being present, and I have known instances of only three or four being present.

514. Are they scarcely ever the same Commissioners who are present?—I could not speak to that; there will frequently be, for several meetings running, the same Commissioners.

515. Do the Commissioners reside within the districts of the Commission?—I think their town residences are all within the district.

516. Are they all at the West End of London?—No, some are in the city; just as the case may be. There are several residing in the north and north-east of London; Stamford-hill and Enfield.

517. What is the name of the Commissioner residing at Stamford-hill?—Mr. Austin. Mr. Mildred is at Leyton, I think.

518. He is not within the district at all?—No, Leyton is down in Essex. We should send the notice to his place of business; he is in town every day at his business, I presume.

519. In what manner are the Commissioners elected?—Under the Act of Parliament.

520. Are they specifically named in the Act?—Yes, with power to re-elect upon the demise or retirement of any of their number.

521. Are they so selected?—Yes.

522. Sir *John Shelley.*] There are a certain number of *ex-officio* members?—Yes, the members for the county of Middlesex, for Westminster, and for the City of London.

523. Mr. *Butler.*] What is the qualification required?—Real property, or a certain amount of money, free of incumbrances.

524. I observe that at a meeting of the Commissioners held on the 15th of June last year, there were present Lord Lonsdale, the Noble Lord in the chair; the Honourable Baronet, the Member for Petersfield, both active Members of this House; Mr. Pownall, a magistrate, and Mr. Kemshead, the county treasurer?—Are those noblemen and gentlemen exactly the sort of men to give close attention to the management of the roads of the metropolis?—If I were to speak my own opinion, I should say that they were the very fittest.

525. Why do you think so?—Because I find that men in a superior class of life, and connected with public business generally, discharge analogous duties to these in a manner more effectual and more to the satisfaction of the public than parties taken from the population at large.

526. In your answer you assume that they would have time to attend to the duties of this commission?—Yes.

527. Seeing that there are scarcely ever the same Commissioners present, the fair inference is, that they have not time to attend?—I do not see it in that way, because a very small portion of time from one man would be much more useful than a large portion from another. A man of education and position may in an hour or two produce an amount of public good that another man would not produce in a month.

528. Is it not the fact that those noblemen and gentlemen necessarily trust very much to the management of their officers?—They must do so to a certain extent; but the officers are subjected, if not to daily, at all events to monthly scrutiny; and it appears to me that the Commissioners exercise very great vigil-

V. C. Wright, Esq.

19 June 1856.

ance over the officers. As far as details go, of course it is impossible that they can look into them. I will suppose an extreme example; suppose the case of my making erroneous entries in the books or committing frauds; it is not within the possibility of any man, whatever his acquirements may be, to follow them out, unless he places himself in the position of a clerk, and attends the office daily. They occasionally look into the details, but they would not pay parties to do that business if they did it themselves.

529. How many Commissioners are there?—I think between 40 and 50.

530. How many perform the duties?—Three are competent to perform the duties, because three are a quorum; but as some of the Commissioners do not invariably attend, the business might run through the whole number of the Commissioners.——(Mr. *Lyon.*) They are governed by the General Turnpike Act, just the same as any other turnpike trust in the kingdom.

531. Sir *William Jolliffe.*] (To Mr. *Wright.*) The Noble Lord, who is the chairman of the Commission, and several other Commissioners, make it a rule generally to attend the meetings?—When in town they do.

532. Do they devote a very considerable time to the transaction of the business?—I should say very considerable. There is the time which they actually give at the office during the meeting, and there are other portions of time during which they are open to communications from the officers who consult them, and occasionally business is handed over to them more exclusively to manage, which they attend to, making a report to the General Board almost in the manner of a paid officer.

533. Are there not some committees of the Commissioners called for finance and other matters, which report to the General Board, and do not they meet generally once a month, besides the monthly meeting of the Commissioners?—Invariably so. There is generally a finance committee before every meeting, with the exception of one instance, which was before the general meeting, when it was not insisted upon; but subsequently I have received directions always to be prepared for the finance committee before every meeting, unless it happens to be a very special one, that may be summoned within a week of the previous one.

534. Does the finance committee always meet before the general meeting?—Always.

535. Do they devote a very considerable time to a minute examination of the accounts which you lay before them?—Yes, they go through them in precisely the same manner as I should do were I paid for an auditorship in any office.

536. They go minutely into each article in the different accounts, and devote the same attention to it in the same manner that a paid auditor would do were he employed to audit the accounts?—Yes, the whole of my entries are checked by them. The bills come to me in the first instance, and I ascertain that they are duly certified, both as to the service being performed, and as to the price charged being a correct one. The calculations are then gone through with me, and they are entered in a book, and laid with that book before the Commissioners at the finance committee. One of the Commissioners will take the book, and another Commissioner will take the bills, and they will compare the entries, examining each bill and its general merits, independently of its correctness. Then an abstract of the whole is laid before the Commissioners, which is checked off by the bills and the book, and I think everything is done but mere additions.

537. Are you acquainted with the manner in which the accounts of other turnpike trusts are audited?—No, not at present. I had opportunities of seeing how they were audited under the former trustees at the formation of this Commission.

538. Do you consider that the accounts are as efficiently audited under the Commission as they were under the former trustees?—I think that the audit is immeasurably better.

539. Do you not believe, from what you have heard, that the accounts of this Turnpike Commission are as well attended to, and the whole business transacted in as careful a manner, as in any other turnpike trust that exists in the country?—There can be no doubt about it.

540. Mr. Alderman *Challis.*] Are the Committee to understand that this monthly meeting have all the receipts of the money paid during the month, and that they examine them, and check them?—Yes, they are examined. They go through

through the bank account, and the bills and money matters, and the general business. And with regard to money matters, I can speak to their extreme strictness.

541. Is that account afterwards presented to the meeting?—Yes, they report monthly. The meeting is generally within a day or so of the committee, and the committee then generally report their proceedings to the general board.

542. Sir *William Jolliffe.*] Upon that report the checks for the payment of those accounts are drawn?—Yes, the committee have no power to draw checks, but merely to recommend that they should be drawn. There have been instances where the board have refused to draw checks for accounts required by the committee; the board have required some further explanation. I remember a particular instance where an account was struck out after it had been recommended for payment by the committee.

543. Sir *John Shelley.*] Is there a treasurer of this Commission?—No.

544. What becomes of the funds?—They are directed by the Act of Parliament to be kept at the Bank of England.

545. Colonel *Pennant.*] Have you any record of the attendance of the Commissioners at the monthly meetings?—Yes.

546. And also at the sub-committees?—Yes.

547. Mr. *Butler.*] With reference to the gate in the City-road, what would be the loss to the trust if that gate were abolished, the trust still maintaining the road?—Judging by the produce, speaking from memory, I should estimate it at somewhere about 3,000 *l.* a year.

548. What is the cost of keeping up the 12 side-bars, and the one gate in the City-road?—I should imagine that keeping up the gate and side-bars would be about 5*l.* a week for the whole of them; the wages are extremely low.

549. *Chairman.*] (To Mr. *Browse.*) It has been stated, in the Return which you have given in, that the amount received by the Commissioners for the City-road gate is about 3,000 *l.* a year; is that so?—It is rather less.

550. The Commission have 10,000 *l.* in Exchequer bills at the present moment, have they not?—They have invested 10,000 *l.* in Exchequer bills.

551. They had a balance at the commencement of the present financial year, amounting to about 13,000 *l.*?—Yes; including the 10,000 *l.*, it is 14,600 *l.*; out of that your Lordship must deduct 9,000 *l.*, the amount of the floating debt; the Committee will observe that the Commissioners are always in arrear of payments, but their toll receipt is in advance.

552. The clear balance is 5,600*l.*?—Yes.

553. Might not the Commissioners venture to take away the City-road gate entirely, and still support that road without incurring much prospect of not being able to keep up the whole road?—The cost of the road is 2,600 *l.* per annum, and the question would arise, from what district you should take money to spend upon the City-road; whether Parliament would consider it just that that 2,600 *l.* should be charged upon any other district, or upon the whole consolidation, the City-road being a district of itself.

554. As far as that amount goes, do you see any reason (supposing the other question settled) why the Commissioners might not give up tolls to that amount?—It does not appear by the present estimate for the year that they will have such a surplus, but until the collection of the ninth district is completed for the next year, and we can ascertain more fully the sacrifice which the Commissioners have made by lowering the toll in that district, I do not think it would be well for the Commissioners to abolish the City-road gate; supposing there were a much greater loss, which I anticipate, upon the ninth district than what has already accrued, I do not see how the Commissioners could afford to expend 2,600 *l.* upon that road without any receipt.

Reverend *John Philip Gell*, called in; and Examined.

555. *Chairman.*] ARE you the Incumbent of a church?—I am Incumbent of St. John's, Notting-hill.

556. Are you acquainted with the Notting-hill turnpike-gate?—I am.

557. Will you have the goodness to state what is the nature of the property by which the gate is surrounded?—It is placed in the middle of a very populous district; and I consider that it has exercised a very injurious influence upon the

Rev. *J. P. Gell.*

19 June 1856.

population of the district, owing to the stoppages which are created at the last turnpike into London. Only last Saturday eight omnibus drivers were fined for stopping their omnibuses at the gate; the result of this going on for years has been, that it is a very desirable position for public-houses and beershops, and although the magistrates have resisted the attempt to bring the public-houses close to the gate, yet the map which I will take the liberty of laying before the Committee will show how many public-houses and beershops have been brought between 200 and 300 yards of the turnpike; the result has been, that it is a very difficult district to do any good in. The rest of the parish all together has not the same number of public-houses and beershops that there are concentrated in that small district immediately round the turnpike. I should like to call the attention of the Committee to the southern side of the main road, which is marked; the Committee will there see that the consequence of checking the communication at the point A, and at the point B, is that the value of land outside the turnpike has been always below the value inside, and that has led therefore, just outside the turnpike, to the collection of a large number of poor and ill-conditioned inhabitants.

558. When you say outside, do you mean the side nearest London?—The western side, further from London; the land has been cheap there, and the stoppage created there has not only led to the formation of an undesirable district on the south side of the road, westward of the turnpike, but I would like to draw attention to the north side of the road. The Committee will see there are three roads converging from the northern district of the parish, which is a handsome and well-conditioned district. Those roads have been created originally by the action of the turnpike; communication has been checked in every other direction except through the turnpike; it has been the effect of the side-gates in time past to drive all communication through that one point, and the consequence is, that the branching of these roads has led to a very undesirable laying out of the district. It has gradually formed in triangular and circular forms, instead of forming in direct streets as would have been the case if direct communications with London had been left open; that of course has led indirectly to deteriorating the value of property, as we all know that if property is laid out in an irregular and bad way, after thoroughfares are formed, it is a thing we never afterwards can get over.

559. Sir *William Jolliffe.*] Wherever omnibuses stop it would have the same effect that you describe at this gate?—Omnibuses would stop where they were wanted if there was no turnpike, and not all in one place; some would stop at the bottom of one place and some at another; they would be spread about.

560. Who are the inhabitants beyond the district of which you complain on the south side of the road; what is their occupation; are they of the labouring class?—The inhabitants south and west of the district are wealthy. The district itself is occupied by the labouring poor.

561. And their houses would be naturally erected in a populous district like this where the land was the cheapest?—Probably.

562. But of course a labouring population must exist where, as you have described, there is also a very large wealthy population?—Yes.

563. And those persons are chiefly employed in that district?—They are crowded into one place, much more than is required for the wants of the district or for their own benefit.

564. Is not it always the case, that the poorer inhabitants of a district are more crowded than the richer inhabitants, or than is desirable?—It is always the case; and stoppages created in a main line of public communication tend to increase the evil.

565. You think that turnpike-gates have that effect?—In metropolitan districts.

566. Colonel *Pennant.*] Where is this population principally employed?—A great number of them are employed in brick-fields; it is difficult to enumerate the occupations of that indefinite population which hangs on all the outskirts of London; some of them go down into London, as far as the docks, for their employment.

567. Supposing the site of all those houses were occupied by large houses, would not the effect of that only be to drive the population a little further from London?—There would have been places nearer London, where it would have been

been for the interest of people to build houses of a proper size for them; but that was the cheapest place, and there was the greatest crowd of houses.

568. The evil of those small houses would only be removed from that locality to some other?—They would have been more spread; some would have been there and some would have been elsewhere.

569. *Chairman.*] The evil of which you complain especially is, that it has caused an immense confluence of beershops and public-houses in that particular spot, which renders it very difficult for you as a minister to do the good you desire among that class of people?—Yes.

570. Sir *John Shelley.*] I presume there are not more public-houses and beershops in the neighbourhood than are required in the neighbourhood generally, but only they are congregated in one place?—Yes.

571. Would not the effect of removing the turnpike-gate be to remove the beerhouses where the omnibuses stop, though further off?—They would be spread about more.

572. Wherever the population ceases, there the omnibuses cease to run?—Omnibuses end their journeys at various points along the road.

573. Mr. *Hildyard.*] What do you propose as a remedy; are you, as a parishioner, prepared to take the charge of the roads upon your parish, or how far do you think it would be acceptable to the parish to do so?—I am not prepared to give any answer on the subject; I have not sufficiently studied it.

574. Was it known to your parishioners that you were coming to give evidence?—A number knew of it.

575. Did not you suggest to them the question of what is to supply the place of the toll that is levied, and are you able to say whether it would be acceptable to them to take the burden cheerfully upon themselves if the gate were removed?—I should not like to express their opinion upon the subject, as they have not commissioned me to do so.

576. I imagine you regard it as a matter of great importance that the road should be kept up in a thorough state of efficiency?—I do.

577. And that cannot be done without a considerable outlay?—No.

578. Have you come here unprepared to substitute anything in the place of the toll-gate to meet that which you admit to be necessary?—I should be very glad to see the toll-gate removed myself, and to pay according to my property for the maintenance of the roads.

579. Mr. *Butler.*] You have said that the omnibuses stopping at one place, the transit is, to a certain extent, impeded?—Yes.

580. And demoralisation has been much caused by that?—Yes.

581. Do not you think that those evils counterbalance any seeming injustice in throwing upon the parishes the repair of what are called the turnpike roads?—The question of the parishes taking the repairs of the roads is one of extreme difficulty, and involves many points upon which the parishes would require to have their interests protected, and I should be very sorry indeed to express an opinion upon such a subject as the propriety of throwing it upon the parishes.

582. In mercantile phraseology, it is simply a debtor and creditor account?—It is.

Henry Isaac Neild, Esq., called in; and Examined.

583. *Chairman.*] YOU reside in Kensington Park Gardens?—I do.

584. You are a member of the Kensington vestry?—I am.

585. You have paid considerable attention, have you not, to the question of the thoroughfares passing through Kensington?—I have.

586. Can you give the Committee an opinion of what the inhabitants generally feel with regard to them?—I have here a map of the parish, which will show the bearing of these roads upon the parish.

587. Are there not two great thoroughfares going through the parish of Kensington, east and west, which are in parts of different trusts of the Metropolitan Commission?—There are.

588. Are there not, besides the gates, innumerable side-bars?—There are several.

589. Many persons wishing to pass from one part of the parish to another would be compelled almost to pay two tolls?—Yes. A party going from the north side of the parish, which occupies a large area, to the south side, would have to pay two tolls; so a party going from the south to the north would also

H. I. Nield, Esq.

19 June 1856.

have to pay two tolls. A party going from the north to the middle would have to pay one; a party going from the south to the middle, another; and parties in the middle would have to pay wherever they go. They can neither go east, west, north, or south, without having a toll to pay.

590. Are the side-bars so placed as to check the possibility of evading the toll?—Regarding the middle from the north, they may go into town without paying any toll at all; and so they may from the south, but not from the middle, except they keep carriages of their own, and then they may get into town through Kensington Palace Gardens.

591. Does this map which you have placed before the Committee show the whole of the parish?—It does.

592. Are those different townships which are coloured in different colours?—They are ecclesiastical districts; there are three or four district parishes within the parish of Kensington.

593. Will you state generally what the grievance is which the inhabitants of Kensington complain of with regard to the maintenance of these turnpikes?—As regards Notting-hill, the gate is placed in a very narrow and tortuous part of the road, and accumulates numberless evils by the collection of disorderly characters and the concentration of numerous beershops and public-houses, and it is rendered sometimes almost impassable to ladies and females of respectability; that turnpike does not take in any considerable portion of the traffic which passes from London through the northern district, and some four or five years ago another turnpike was placed on the main road, one mile below the present one.

594. Do you mean further west?—Yes, further west, further out of town; that was done for the purpose of catching all the side streets. I think there are six or seven within that mile by which parties might get along through the north side of the parish out of town without paying any toll at all, and therefore the toll-gate was placed in the middle of the road a little lower down, about a mile, just upon the verge of the parish. The inhabitants of Notting-hill contend that that would be sufficient to collect the toll for the repair of the road passing through that portion of the parish. All who pay at the upper gate going into the country would still have to pay at the lower gate, whereas all who live between the lower gates now avoid the toll by passing along Kensington Gardens and Chepstow Villas. Therefore if the gate were removed at the top of the hill, it is believed that there would be very little loss of toll comparatively, inasmuch as the same toll would be received at the bottom of the hill, and it was expected when that toll gate was placed at the bottom of the hill it would lead to the removal of the gate at the top of the hill; but that is not yet realised.

595. Sir *William Jolliffe.*] How long has that gate been at the top of the hill?—Farther than my memory goes back; certainly 40 years. There always has been a gate there, but not exactly in the same position.

596. *Chairman.*] Is not that in as bad a position as it possibly can be, considering the amount of the traffic and the width of the road?—I do not think it can be in a worse position than it is.

597. Can you state what is the feeling of the parishes generally; are they ready to take the roads and pay for them?—I think not, and for this reason: these roads, which really belong to the parish, which form the intercommunication between the different parts of the parish itself, I think it is very probable they would not object to take. I am not authorised to say that, but that is my own opinion. But it would be unfair to lay the whole burden of those two main arteries leading from the country into London upon the parishes through which they pass. Paddington, which has a mile and a half of the same road running through it, has been entirely relieved from toll without any portion of the cost of that road being thrown upon the parish. If I am rightly informed, that road, for a mile and a half from the Marble Arch to the commencement of the parish of Kensington, is maintained out of the tolls received within the parish of Kensington; so that Paddington has been relieved at the expense of Kensington. The same remark applies to the main road; the two roads together do not occupy a mile and a half, the road through the parish, and the one through Kensington and Notting-hill; the traffic upon them is very immense, as every one knows; it is the leading thoroughfare from the west into London, and is used perhaps more by the general population than it is by the inhabitants of the parish itself, and therefore

therefore it is only reasonable that those roads should be, in some degree, at all events, maintained by the tolls; but as regards the cross streets and the other roads of intercommunication between the parish, I think it is not improbable that if the parish were relieved from tolls altogether, they would undertake the repair of those roads.

598. Is a part of that intercommunication maintained by the Metropolis Commission?—I think there are seven miles and two furlongs within the parish of Kensington maintained by the Commissioners.

599. How much out of that is composed of those two great thoroughfares?—About 2 ½ miles, not more, and probably less.

600. If the parish were entirely freed, you think they would be willing to take that?—I am not authorised to say they would do that.

601. You stated just now you did not think it just that the parish of Kensington should maintain two of the great leading thoroughfares to the metropolis in that parish, and you instanced the case that Paddington did not maintain its fair share of that thoroughfare, and other parishes might be similarly situated; are you aware that greater thoroughfares than those do exist in London, such as Piccadilly, Oxford-street, Regent-street, and Whitehall; are you aware that those thoroughfares are entirely maintained by the parishes through which they run?—So I understand, and I think that when roads become streets and form part of a town, that is the proper mode of maintaining them; but where very much frequented roads, such as these, pass through a suburban district, which is only partially covered with buildings, they ought to be maintained by tolls, but those tolls should in my opinion be placed at the extreme of the population, not within it; because whenever the population gets beyond them, there are always a great number of thoroughfares branching from them, which must be maintained by side-bars, and that has a very serious effect in the depreciation of property beyond the toll; therefore the proper course I think would be, that all intercommunications amongst the neighbours themselves should be maintained by the parish, but that the main thoroughfare, and that alone, should devolve upon the Commissioners. This is only an idea of my own.

602. You stated that you think even the main thoroughfares should be supported by the parishes when those main thoroughfares become streets?—Yes.

603. Is it not the fact, that this great thoroughfare through the parish of Kensington is entirely a street from one end to another?—Not exactly; it is in a great measure so, but not to be compared with Oxford-street or the Edgware-road. From the Edgware-road to the Marble Arch is maintained by the parish in the same way as Oxford-street, but the portion of the road from the Marble Arch to Kensington is maintained by the Commissioners, at an expense of about 1,500 *l.* a mile.

604. Is not that entirely street?—It can hardly be said to be so; the Park and Kensington Gardens extend along one side of it, and although the other side is now built upon, it can hardly be called a street.

605. Is not Grosvenor-place in the same position?—Yes, it is.

606. Nearly half Piccadilly is in the same state, is it not?—There they are much more built upon; they have all streets running into them; they are more closely united by houses and buildings, considerably.

607. Is there any intermission whatever in the street between the Kensington gate and the point where the metropolis road goes out of the parish towards Hammersmith, so far as the parish of Kensington is concerned?—At the other end, the western extremity is not very closely covered; there is Lee's nursery.

608. Is there any intermission of street in the parish of Kensington?—I do not know that there is in the parish of Kensington; there is Lord Holland's park, and some other vacant ground on the western side of Kensington. Kensington was a town of itself in ancient times. It is not like a newly built district, such as we have on the north side of the parish. It was a village, and I believe pretty continuously built upon, for some time.

609. Have you anything further to state as to the feeling of the inhabitants of Kensington?—They have a decided objection to take upon themselves the maintenance of those two main thoroughfares; the expense per mile is so great compared to what it is with regard to the ordinary intercommunication of the

H. I. Neild, Esq.

19 June 1856.

parish, that I think they would be very unwilling to have the burthen thrown upon them.

610. What is the highway rate in the parish of Kensington?—The general rate is 4½*d.*, but that embraces many other matters.

611. Sir *John Shelley.*] Do you know the case of St. Margaret's and St. John's with regard to the gate at Kensington?—I believe a portion of the road belongs to the parish of Kensington, and another portion to St. Margaret's; but I am not familiar with that.

612. If the inhabitants of the parish of Kensington, having the advantage of those two main thoroughfares running through the middle of the parish, object to take upon themselves the expense of maintaining those roads, a parish like St. Margaret's and St. John's would have an additional right to find fault?—I should think so.

613. Sir *William Jolliffe.*] Take the southern road; is not the whole of the road through Kensington just as much a street as Piccadilly?—I can hardly say that it is.

614. Do you not think that the objection to maintaining this great artery or thoroughfare is quite as strong with regard to Piccadilly, as against the parish, as it is with regard to Kensington?—No, for this reason, the property is much more valuable in Piccadilly; the ground is much more covered, and the rate would be much less than in a parish like Kensington.

615. Would the removal of the gate add to the value of the property in Kensington?—Very much, no doubt.

616. And that equivalent would be gained?—Yes, to a certain extent, but that would be met by taking the cross-roads.

617. *Chairman.*] Would not they have more rateable property?—I think so.

618. Then the rate would be diminished?—Yes, and they would be better able to maintain the whole of the roads as the property became more valuable.

619. Sir *William Jolliffe.*] The remedy you propose is, that the gate should be shifted?—Yes.

620. And that the other gate should be done away with; that is your proposition?—Yes.

621. Do you not think the parishes of Hammersmith and Fulham would have great causes of complaint if they were shut up by those turnpike gates in a manner that they are not now?—I think not; we should still have to pay the toll if we went into the country, and I do not think there would be any objection to that; the great burthen upon Kensington is, that it interferes with the communication between one part of the parish and another; without using the road at all, if we merely cross the road from the north to the south side of the parish, we are compelled to pay two tolls.

622. To have a toll demanded from you, you must go 100 yards along the turnpike road?—Suppose I wanted to go from Notting-hill to Brompton; I only cross the road at Notting-hill, but I am caught by a side bar in Silver-street, and then I get into Kensington, and merely cross that road again, and I am caught by another side bar, which makes me pay on going into Brompton.

623. You must have passed more than 100 yards in every case before the toll becomes payable?—Yes, because the trust extends to the cross roads; it is only the main road that I think ought to be maintained by toll, not the cross roads; the great evil upon Kensington is, that we cannot move from one part of the parish to another without paying two tolls.

624. And without travelling on the turnpike trust?—We do not go along the main road; the side bars are placed there merely to prevent the avoidance of the toll upon the main road, not for the maintenance of the streets.

625. The Commissioners have the power, wherever the road is maintained by the Commissioners, of erecting a gate, and every one passing 100 yards along the road is liable to toll at that gate?—Precisely, but still the objection applies all the same. In getting from one part of the parish to another, we do not use the main road, which it is the principal object of the Commissioners to repair; but inasmuch as side bars are placed on the side roads to prevent the avoidance of the toll upon the main road, it is for that reason we pay it.

626. If parish roads were constructed from north to south, through Kensington, and were wholly maintained by the parish, and merely crossed the turnpike roads there, the Commissioners would have no power of taking tolls?—You

—You cannot get across in a carriage from the north side of the parish without paying two tolls, although you simply cross the road.

627. Colonel *Pennant.*] In crossing from one road to another, you must pass 100 yards along the main road?—No, that is not necessary; in some cases the streets are opposite.

628. *Chairman.*] The Metropolis Commission maintains not the main roads only, but the others also?—Yes, I am aware of that; because if they did not do so, the toll upon the main road would be evaded.

629. With regard to the effect upon the value of property in the neighbourhood of a road produced by the removal of a gate, can you give any evidence of that?—I believe the existence of a gate has a very depressing effect upon all property beyond it, and the removal of it gives great elasticity to that property, and it becomes more valuable.

630. Can you give any special instance of that?—I cannot.

631. Sir *John Shelley.*] The effect of your proposition upon the main roads would be to remove that depression of property in Kensington and put it upon the parish beyond, would it not?—No, the population does not extend beyond; where it does extend, the same objection would apply decidedly. I see no objection to gates in a country district where there is not a pressure of population, but I do in populous districts.

632. Does not a gate in a populous district yield more toll for the maintenance of the road than one further on would do, in which case the toll would have to be made up in some other way?—Yes, if it is protected by side-bars; but all the population at Notting-hill which lies to the westward of this gate and between the two gates can get into London without paying any toll at all. The objection we have is, that we cannot get across from one part of the parish to the other without paying these tolls; we can get to London without paying any toll at all.

633. Mr. *Hildyard.*] There can be no doubt that the propinquity of Kensington to London is one main cause of the value of the property in Kensington?—Undoubtedly that has a great effect upon it.

634. Yet you think it a grievance that you should have to pay any toll for the maintenance of the road which keeps up the communication between Kensington and London?—No; there is no objection to the payment of one toll, nor do I know that the Kensington people very much object to the payment of one toll upon the main road; the great objection is, that we are saddled with two tolls in the communication between one part of the parish and another.

635. As regards the toll at the commencement of Kensington upon the main turnpike road, to that you have no objection?—Yes, I have, because it involves the necessity of having several side-bars, and puts a stop to free communication between the district; and the object of these main roads being to communicate with the country, all parties going along that main line of road may, by paying a toll at the extremity of the populous district, furnish a sufficient sum for the maintenance of the road.

636. Whether your objection to the toll is on account of the main bar itself, or incidental, on account of the necessity of maintaining side bars, you do object to it?—Yes, I should object to the imposition of a turnpike in any populous district.

637. Having admitted that the value of property at Kensington is mainly owing to its propinquity to London, you think it unreasonable that property at Kensington should be taxed for the purpose of maintaining the communication between the two places?—No, I do not.

638. How would you have it taxed?—This road is not simply for the convenience of Kensington, it is far more for the convenience of London and the country beyond Kensington; and if that road were used by the inhabitants of Kensington alone, in order to get to London, I should say, unquestionably, there could be no objection to the cost of maintaining the road being thrown upon them; but inasmuch as this great road is used by a population 10 times that of Kensington, I think they should contribute something to the repair of that road.

639. In what mode would you suggest that that should be accomplished?—I think a toll placed at the extremity of the suburban districts of London, and collected there without any side bars at all, would yield a sufficient sum for the maintenance of the roads if the Commissioners had nothing to do with the side roads.

H. I. Neild, Esq.

19 June 1856.

640. Speaking of the western communication, would you have any toll-bar in Kensington?—I should have no objection to one.

641. What do you think the people of Hammersmith would say to have their communication with London cut off by a toll-bar, when you think it so highly reasonable Kensington should not be subjected to it?—If Hammersmith can make out as good a case of obstruction and injury to property as Kensington, I should say they would be entitled to have the gate put lower down.

642. Is there any doubt that the road through Hammersmith is used for the purposes of the public, as well as that of Kensington?—Certainly not.

643. What would be the effect of abolishing the tolls, and throwing the cost of that portion which is now borne by the metropolis roads upon the parish, so far as your rates are concerned?—I have not considered that.

644. Do you happen to know that, assuming the tolls were abolished altogether, and the parishes had to bear the expense of maintaining the roads, the rate to be levied upon Hammersmith would be three times as great as the rate to be levied upon Kensington?—I am not aware; but if that be so, it is a very good reason why the Hammersmith people should not object to the existence of the gate.

645. Do you imagine that the sum which is now levied by the metropolitan trust would not be diminished if you took away the Kensington bar, and left the one at the entrance to Hammersmith?—Not very materially. At Notting-hill, if the gate were removed, the loss of toll would not, I think, be very great, inasmuch as all the through-going traffic would pay the same toll at the bottom of the hill, and all the intermediate traffic (except that going from one part of Kensington to another) between those two gates would come into London and out again without paying any toll at all.

646. Can you entertain any doubt that if the main bar and all the side bars in Kensington were removed, a very large loss would accrue to the metropolitan trust?—I think it is very probable, but I am speaking now only of Notting-hill gate; there are two gates within a mile of each other, and they have only existed for five years; if the one at the top were taken away, I think the loss of toll would be comparatively little; I am told that it has been estimated at 2,000 *l.*, I should put it much lower. The parish of Paddington, from which the toll has been removed, is maintained out of this parish at the rate of 1,500 *l.* a mile for a mile and a half.

647. Did you speak of the effect of the value upon property by the reduction of tolls from general knowledge, or are you the owner of property in Kensington?—I am not.

648. What district do you live in?—In Kensington Park Gardens.

649. That is in the north district?—Yes.

650. If those houses of a low description do grow up as a necessary consequence of a turnpike, putting the turnpike where you state you would put it would call up that nuisance to a certain extent in the place which you select?—I am not competent to answer that; no doubt property immediately beyond a turnpike is less valuable than that within a turnpike, and being let to persons who cannot afford to pay a high price for property, it becomes of a lower character.

651. I understood you to say, that that was the ground upon which you assumed the low property beyond the gate in Kensington had grown up, in consequence of the diminished value on the outward side?—No; I cannot speak to that from my own experience.

652. Are you acquainted with that low class of houses and inhabitants in the contiguity of that gate that was mentioned by the last witness?—There is a good deal of property within the parish, on the western side of the gate, which is of a very low character; and probably if the property had been on the London side of the gate, it would have been more valuable, and would have had a better class of houses put upon it.

653. Do you think this Committee can act upon the assumption that that class of property grew up solely and exclusively owing to the existence of that gate?—I think not. I do not think that that is a necessary ingredient in the consideration of the turnpike trust; it is a consequence of the imposition of these tolls which diminishes the value of property.

654. *Chairman.*] You have been asked by a Member of the Committee whether

whether you think Hammersmith would like to have a gate placed in the position in which you propose it should be placed; would Hammersmith be in the slightest degree more aggrieved than it is at the present moment?—Not at all.

655. Your opinion is for Kensington, and not for Hammersmith?—Yes.

656. And even in the proposition you make, supposing those gates were removed, and that gate continued at the bottom, speaking for Hammersmith, Hammersmith would not be in a worse position?—Not at all. I believe the effect of removing the toll-gate at Notting-hill, and throwing that portion of the road upon Paddington, from which Paddington has been relieved, would be that the Commissioners would gain instead of losing by it.

657. One of the things that the inhabitants of Kensington very much object to is having this toll, and being extremely interfered with in their communications, in order to keep through roads that go through other parishes?—Yes, that is one of the great grievances.

658. You stated that if those gates were removed, one of your reasons for supposing that the Metropolis Commission would not lose so much is, that you think the inhabitants would take all the side roads, which are now kept at the expense of the Commissioners?—That is my own opinion, but I am not authorised to say so.

659. Is not that one of the reasons why you supposed that it might be practicable to remove those gates further from London than the place where they now stand?—I think so.

660. Sir *John Shelley.*] You are a member of the Kensington vestry?—I am.

661. Were you a member of the old vestry before the alteration?—I was not.

662. You are aware that the Commission were prepared to receive application from parishes that were ready to take the roads upon themselves; has any application ever been made from the parish of Kensington, proposing to take upon themselves the management of those roads?—None to my knowledge.

663. Would the present vestry be prepared to make such a proposition?—It has never been submitted to them, and I am not competent to say what their opinion would be. The question of removing those gates has been discussed in the vestry, and a strong opinion has been expressed against the whole of the roads being thrown upon the parish, because they consider that these roads are very largely used by a vast number of people, 10 or 20 times the inhabitants of Kensington, and, therefore, they think they ought not to have the whole burden thrown upon them; but I think in those parts it is possible, if it were laid before them, they might entertain it.

664. Although you stated you were not authorised to give any such opinion, yet the matter has been discussed in vestry, and the impression upon your mind is that such a proposition might be acceptable to the vestry of Kensington, for the vestry to take upon themselves the control of the roads?—I cannot pledge the vestry to such an opinion; the proposition I have thrown out has not been mooted; the general question of taking the whole of the roads upon the vestry has been considered, and a strong objection has been taken on account of the very great traffic going over the main roads.

665. *Chairman.*] Do you not think that the argument of the road not being used only by the people of Kensington would be equally applicable to the parishes of St. George's, St. James's, St. Margaret's, and others who keep up themselves those immense thoroughfares?—Undoubtedly to a great extent; but the one is in the midst of the town, and is used by all parties, and the other is a suburban district, the inhabitants of which do not derive so much benefit from it.

666. How much street and building would you require in order to state that a place had passed from its suburban character into the urban character, which we apply to places forming part of a town?—It is not for me to say when it throws off its suburban character entirely and assumes that of a town, but undoubtedly when it is paved and there are continuous lines of streets without any interruption, I should then say it becomes very much a town.

667. Are you really of opinion that Kensington can still have any pretensions to a suburban character?—To a certain extent; but that is a matter of opinion.

668. Mr. *Hildyard.*] The expense of the metropolis roads of Dublin is cast upon the whole county of Wicklow; how far, in your opinion, would it be acceptable to Kensington, or, if you cannot speak to their opinion, how far should you acquiesce in the expense of the metropolitan trust being borne, as far as the north side goes, by the whole county of Middlesex; how far should

H. I. Neild, Esq.

19 June 1856.

should you be prepared to acquiesce in removing the bars and levying upon the county of Middlesex the cost of maintaining the roads in their present efficiency?—I think there would be great objection to that course.

669. That would be more acceptable to the people of Kensington than maintaining the road for the people of Middlesex to pass over it?—The question of tolls is a very difficult one; it certainly is a very objectionable one, on account of the expenditure wasted upon them and not applied to the roads, which I have heard estimated at 20, 30, 40, and even 50 per cent.; but I certainly conceive that public turnpike roads from one town to another are very fairly maintained by the collection of tolls; my objection to the existence of toll-gates in populous districts is that it has a depressing effect upon property, and interferes very much with the communication between different parts of a populous district.

670. The Committee wish to know, in your judgment, how are we to raise the money for keeping up the roads?—The toll ought not to be remitted to the injury of the roads; a sufficient toll ought to be collected for the maintenance of the roads, but in the particular case of Notting-hill I conceive there is already a sufficient toll, without the two gates; I think the top gate might be dispensed with, without any material loss of income, so as not to interfere with the due maintenance of the roads.

671. I understand you to state, that you think the metropolis roads ought to be maintained by tolls, but in the case of Notting-hill you think there is a grievance that ought to be removed?—That is so; but I do not mean to say that there is no grievance except at Notting-hill. Wherever a toll-gate exists in a populous district, it is a great grievance to that district.

672. Am I to understand you to state, that the metropolis roads ought to be maintained by tolls, redressing grievances where they can be shown?—I did not confine my remark to the metropolitan roads. I conceive that all great lines of road which connect one town with another ought to be maintained by tolls. I do not mean to say that the roads within the metropolis ought to be maintained by tolls.

673. I want distinctly your answer; do you think the expense of maintaining the metropolitan system of roads ought to be met by tolls, redressing special grievances where you think they may exist, or do you propose anything in substitution of tolls, as regards this metropolitan system?—I am hardly competent to answer that question. I think that so far as tolls can be raised for the maintenance of large thoroughfares, without interfering with the communication in the populous districts, they might with great propriety be maintained; although I still think the system of collecting the revenue by tolls is not a good one, at the same time it is very difficult to know how to find a substitute for it. The instance that you have mentioned of Hammersmith, is a case in which it would tell very heavily upon that district, and so it would upon many others.

674. Do you still propose that the metropolitan system of roads should be maintained by tolls, redressing grievances where they exist, or have you any suggestion to make to the Committee in lieu of the taking of tolls and the existence of toll-bars?—I must repeat that it should be partially one way and partially the other; the main leading thoroughfares, I think, ought to be maintained by tolls, and those tolls should be collected at the extremes of the population, and the expense of maintaining all the intermediate streets should be borne by the parishes themselves.

675. Sir *John Shelley*.] Should you be prepared to propose to the Kensington vestry to say, yea or nay, would they offer, during the time the Committee are sitting, to take the other roads, leaving the main thoroughfare to be managed still by the Commission, and do you think such a proposition would be carried?—I cannot tell you, but I am quite prepared to lay that proposition before the vestry at our next meeting, and report the result to the Committee.

676. Mr. *MacGregor*.] Will you explain what wasteful expenditure on the maintenance of the metropolitan roads you have heard estimated at 40 to 50 per cent. of the receipts?—The expense of collecting and keeping the different gates, and keeping persons there, and the profit of the lessees, which I am told in many cases has amounted to a very large sum indeed; but it is a speculative opinion entirely.

677. Sir *John Shelley*.] With regard to Notting-hill road, you stated you believed that that gate might be done away with, and the road well maintained; do you give that opinion upon any data?—I have stated the reasons for it.

The

H. J. Neild, Esq.

19 June 1856.

The revenue derived from those two lines of road constitutes more than two-fifths of the whole revenue received by the Commissioners; the loss by the removal of the toll-gate at the top of the hill would be in a great measure compensated by the tolls received at the gate at the foot of the hill, because the greatest portion of the toll received at the top of the hill would be received at the bottom, for all the intermediate traffic does not go through the gate at all.

678. And those gates clear one another?—They clear one another.

Martis, 24° *die Junii*, 1856.

MEMBERS PRESENT.

Mr. MacGregor.	Sir William Jolliffe.
Sir Benjamin Hall.	Mr. Hastings Russell.
Sir John Shelley.	Mr. Hildyard.
Mr. Alderman Challis.	Mr. Butler.
Lord Robert Grosvenor.	Mr. Alcock.
Mr. Bonham Carter.	Mr. Wrightson.
Colonel Pennant.	Mr. Wyvill.

LORD ROBERT GROSVENOR IN THE CHAIR.

Henry Browse, Esq., called in; and further Examined.

H. Browse, Esq.

24 June 1856.

679. *Chairman.*] YOU stated, in answer to a question that was put to you the last day, that you were not able to inform the Committee what the loss to the Commissioners would be, supposing a gate were removed from one place to another; that it was scarcely possible you could tell what would be the loss to the Commissioners; could you give the Committee some idea of what the loss to the Commissioners would be upon the removal of any of the gates which were specified?—I have formed an estimate of the sum, which I can state. I was asked in the evidence given last time, at Question 419, "Can you give approximately any idea of what proportion you would lose?" that was upon the removal of two gates between Hampstead and Highgate; I stated inadvertently two-thirds; it should have been one-third; I wish to correct that; about one-third of the amount in that district would be lost by the removal of those two gates.

680. Sir *John Shelley.*] Then there is a question which immediately follows, "Can you give the Committee any grounds upon which you form that estimate?" Can you now give any grounds upon which you form that amended estimate of one-third?—From the best information I can obtain, the loss by the removal of the Hampstead and the St. Pancras-road gates, that is, the total abolition of those two, would be about 2,500 *l.*, and the loss of taking the Islington gate would be 3,500 *l.*, making 6,000 *l.*

681. Mr. *Bonham Carter.*] How do you calculate that?—It is merely an estimate; we have no exact data to go upon; it is an estimate from the best information we have.

682. I suppose in that case you consider that the vehicles which pass through that gate which would be freed with their tickets at the next gate, would still pay; you calculate that, I presume?—I do.

683. And the loss upon vehicles passing through that gate which would not pass through any other, amounts to one-third of the whole?—Yes.

684. Sir *John Shelley.*] Are there not five lines of omnibuses which go through those two gates?—Yes.

685. Do you know how much a week those omnibuses pay upon an average?—I do not.

686. Who can answer that question; is there any account that will show?—There is none; those tolls have not been in hand since 1837; they have been constantly let; the Commissioners therefore have no means of ascertaining that fact.

687. If I understand you, those tolls not having been in hand, you cannot give any information to the Committee as to what proportion of the tolls received at those two gates is paid by public conveyances?—I cannot.

H. Browse, Esq.

24 June 1856.

688. *Chairman.*] Supposing the Commissioners had a surplus and wished to remove a gate which was let as part of a district, what means would they resort to in order to ascertain what loss would fall upon them by removing that gate?—They would get the best information they could upon the subject.

689. Such as you have now furnished to the Committee?—Such as I have now furnished to the Committee.

690. Can you state to the Committee what the loss would be by removing the gate at Notting-hill altogether?—I estimate the removal of Notting-hill gate altogether at 1,600 *l.* per annum.

691. Sir *John Shelley.*] What is the annual value of Harrow gate?—It is let at 1,110*l.* for the present year.

692. It is the only gate between London and Harrow?—Yes.

693. *Chairman.*] Can you tell what the Kilburn gate produces?—The Kilburn and Edgeware, the seventh and eighth districts, are now let for 3,300*l.*

694. Can you give the Committee a statement of the amounts for which the different districts are let, distinguishing, as far as may be, the different gates?—We can give a statement showing the amount at which each of the districts are let; for instance, where they are combined. The first and second are let together; the third, fourth, and fifth are let together; the seventh and eighth are let together; the 11th, 12th, 13th, and 14th, are let together. Those accounts can be furnished to the Committee; but, unless where the gates have been in hand, the Commissioners have no means of furnishing the amounts received at the different gates.

695. But you can furnish to the Committee an account of what those gates produced when they were last in hand?—Yes.

696. Will you do so?—I will endeavour to get such a statement prepared.

697. Sir *William Jolliffe.*] Are you well acquainted with the district of the Metropolis Board of Works, the newly-constituted district?—I know it so far as it extends upon the metropolis roads.

698. Is it co-extensive with the parishes?—I think it is; it is marked upon those plans laid before the Committee.

699. Can you furnish the Committee with a correct account, or a tolerably correct account, of the expense of maintaining each portion of road within each parish within that district?—I consider I have done so. If I rightly understand the question, it is printed already; the portion of metropolitan roads within each parish within the limits of the Metropolitan Local Management Act is already printed.

700. The first page is that within the district, the second is that without the district?—Yes.

701. *Chairman.*] You have already illustrated the turnpikes and bars; will you be kind enough to mark out the different parishes through which the metropolitan road trust goes upon that map?—I have some doubt if I shall be able; if I can do it, I shall be very happy to do so.

702. Especially to mark the place where the different trusts commence?—That I can do. I will put a red line across the road at the commencement of the trust; that is easily done. I can probably mark the outer boundary of the Metropolitan Local Management Act, but I doubt if I can distinguish the parishes within it.

703. Mr. *Hildyard.*] How do the omnibuses pay their tolls; once a week, or how frequently?—I believe that is not regular in any case; frequently a toll is paid going one way, which pays for the return. In some cases they pay going, and pay again coming back.

704. But how frequently, I mean, are the payments made; they do not stop at the gate, I presume, to pay as they go through, but they pay in a lump for a certain time?—If they pay every time they go through, they do not stop; the conductor invariably hands the money as they go through; they generally, I believe, in going the first way of their journey, pay double toll, to cover the return; and in some cases an account is kept of the number of journeys, and it is paid weekly, or at the end of every day, or at the end of the month.

705. Is the grievance of the omnibuses the money that is to be paid, or is it that they object to being stopped as they pass through the gates?—I believe I may say it very seldom happens that they stop at the gate merely to pay the toll, because the gate is made a stopping place, nine times out of 10, for taking up and setting down the passengers.

706. Mr.

706. Mr. *MacGregor.*] Have you any estimate of the total amount received in toll paid by omnibuses?—I have made an approximate estimate, and, in round numbers, it is about 26,000 *l.* a year, or nearly one half of the whole.

707. That is the amount of toll paid by omnibuses at all your gates, according to that estimate?—Yes.

708. *Chairman.*] You have seen such a thing as an omnibus in London, have you not?—Yes.

709. Do they carry nothing but the omnibus proprietors?—It is hard for me to say whom they carry. I believe they carry generally 25 or 26 people.

710. Perhaps it may be said they carry the public?—Precisely; it may be said so.

711. Sir *John Shelley.*] Do you know how much money you receive annually from the Harrow-road trustees?—That is more a question for the accountant; but I believe it is about 3,600 *l.*

712. How is that spent; where is it spent?—The sum received from these estates is applicable to both the Edgeware and Harrow roads.

713. How many miles?—About 20 miles.

714. How can it be 20 miles from Harrow to London?—The Edgeware-road is 11 miles, and the Harrow-road is nine.

715. You spend that 3,600 *l.* as far as it goes upon the 20 miles; is that it?—There is a certain portion paid to the parishes of Paddington and Marylebone annually, directed by the Act of Parliament to be paid to those parishes for the roads within each parish; the remainder is applicable to both the trusts.

716. Mr. *Butler.*] Can you tell the Committee the value of Clapton gate?—I cannot.

717. Are you aware that there are two gates very close together: the Clapton gate in the fifteenth division, and the Lea Bridge gate in the sixteenth?—It is so.

718. So that a person living at Clapton, having occasion to go that road, would have to pay two gates if he passed from his house three quarters, or half a mile?—It is so; the one being the road toll, and the other more properly the bridge toll.

719. Was the second toll, that of the Lea Bridge-road, made for the purpose of forming the bridge?—The bridge, and the road beyond it.

720. I believe it is also the fact that a gentleman may drive from London to Clapton, taking the same point at starting, and pass over five miles of road only paying one toll?—It is so.

721. Or if he prefers it, he may drive several miles on the road through the Victoria Park, reach London, and not pay any toll at all?—He may.

722. Do not you think that that presses rather heavily upon the poor man who keeps carts and horses, and leaves the gentleman in his carriage to pass nearly free; does not it operate in that way?—The poor man has an opportunity of avoiding the toll, if he will go far enough round for that purpose.

723. Are you aware that the Bayswater omnibuses run every three or four minutes from Mile End gate?—I believe the Bayswater omnibuses run nearly every five minutes from Bayswater to Whitechapel.

724. Do they use the Whitechapel-road for three quarters of a mile without paying toll?—They use the Whitechapel-road for three quarters of a mile from Whitechapel Church; but about half a mile is repaired by the parish.

725. At all events, they use it without paying toll?—They use a quarter of a mile of the road belonging to the trust without paying for it.

726. Are you aware that a short time ago they paid a composition of 1,000 *l.* a year to the trustees in lieu of toll?—I am not.

727. The omnibus proprietors, at all events, are not assessed to the highway rates upon their parish?—I am not aware that they are assessed to the highway rates.

728. Is it not, in your opinion, due in some measure to the reduction of toll that the public, and in particular the inhabitants of Whitechapel, are benefited by the greater facilities of communication consequent upon the reduction of the toll at Whitechapel Church?—That fact is not borne out by experience; no diminution of the fares has taken place in consequence of the reduction of the tolls upon the ninth district.

729. Colonel *Pennant.*] Do you still adhere to the opinion which you gave the other day before the Committee as to the impossibility of extending the area of clearance in cases where the districts are very much confused and intermixed without subjecting the trustees to such an evasion as would entail a serious loss?—

H. Browse, Esq.

24 June 1856.

loss?—I did not wish to imply that it was impossible to do so; my remark was that it would be attended with much reduction of income, and that I thought it was open to the chance of some considerable fraud; and it would render it necessary that all the district or area, of whatever extent it might be, should be let in one lot.

730. Have you at all reconsidered that question?—I have.

731. What is the result of that reconsideration?—I am still of opinion that there would be a possibility of fraud, and that the districts must be let together, and that it would tend to diminish the income.

732. Mr. *MacGregor.*] You have been asked a question as to the traffic through particular gates; would there be any difficulty in sending proper persons to take the traffic at the different gates, so as to calculate for the Committee what it is?—We could do so.

733. Mr. *Hildyard.*] You have stated that the whole revenue derived from the omnibuses is, as far as you can remember, 26,000 *l.* a year?—Yes.

734. You are not able, possibly, to say what mileage those omnibuses run over?—I am not positively able to state; it is very considerable.

735. What would you say is the approximate distance travelled by those omnibuses?—I should like to have more time for answering that question.

736. Sir *Benjamin Hall.*] You stated in answer to a question put to you by the Honourable Member for the Tower Hamlets, that although there had been a reduction of tolls upon the portion of the road which lies within the Tower Hamlets, there had not been any corresponding reduction in the charge by the omnibus proprietors; is that the case?—The portion of the road I allude to is not within the Tower Hamlets, it is within the ninth district.

737. Applying the question to the ninth district of the metropolis roads, I understand you to say, that although there has been a reduction of the tolls, there has not been any corresponding reduction in the charge of the omnibus proprietors to the public?—I am not aware that there has been any reduction since that time.

738. Within the last few years several toll-gates have been taken off within your district, either within the metropolitan area, as set out by the Act of last Session, or immediately outside that area. Are you aware whether the public have benefited by a lower charge made by omnibus proprietors upon those lines where the toll-gates have been taken off?—I am not aware that they have.

739. *Chairman.*] There have been no toll-gates taken off within the last nine years, have there?—Within seven or eight years.

740. Mr. *Hildyard.*] There was a remission in the last year in the rate of toll?—There was a reduction in the rate of toll last year.

741. Sir *Benjamin Hall.*] Still, upon those lines where there has been a considerable reduction of toll you are not aware whether there has been any reduction made in the charge for the carriage of passengers by omnibus proprietors?—I am not.

742. *Chairman.*] You cannot say one way or the other, can you?—I am inclined to think there has not been.

743. Mr. *Alcock.*] You have stated that the tolls bear a very small proportion to the whole expense of the omnibus; have you any idea what proportion they bear to the expense of the omnibus?—Very small indeed.

744. Therefore it does not follow that because you take off the toll, or reduce the toll, that you are to reduce the charge upon each passenger?—It has not followed.

745. Mr. *James MacGregor.*] Will you be good enough to explain to the Committee as to the tenth district, called the City-road; what would be the effect if that toll were taken off altogether?—The effect would be the loss of an income of 2,800 *l.* annually.

746. That is not mixed up with any different district?—It is not; I should say that all stage carriages, having paid upon the ninth district, are free upon the tenth.

747. Is that the case *vice versâ*?—No, it is not.

748. Then paying on the tenth does not free them on the ninth?—No.

749. Mr. Alderman *Challis.*] Have you a separate account for Islington?—It let last year for 14,500 *l.*

750. Have you a separate account of the expense?—The expenses are, I think, not separated.

751. Is

751. Is there money in hand upon that trust?—I believe there is a balance in favour of the trust. *H. Browse, Esq.*

752. Do you know the amount?—No; the accountant will be better able to furnish it; the return printed shows the expense. 24 June 1856.

Mr. *Richard Thomas Swain*, called in; and Examined.

753. *Chairman.*] ARE you a House Agent?—Yes. Mr. *R. T. Swain.*

754. Where do you reside?—At the Lodge, Notting-hill.

755. Have you been in the habit of letting land?—Of letting houses, principally in that district.

756. Can you state to the Committee whether the position of the gate at Notting-hill has had any effect upon the surrounding property, and if so, what effect?—The effect of the gate at Notting-hill is to prevent the letting of property, so many persons objecting to come through the gate, some from the cost of the gate, and others from the extreme annoyance of it.

757. The annoyance being, that there are a great many public-houses in the immediate neighbourhood, and the consequence is, of course, that there are those people loitering about those public-houses who loiter about all public-houses; is that so?—Yes. I have heard them express very strong antipathy indeed against it, and particularly gentlemen who have had females in their carriages; I have positively seen them shudder at the idea of taking the ladies through the gate.

758. That, I presume, affects property in the immediate neighbourhood of the gate?—I consider it affects property in every way; because if we had a more ready letting of property, we should have greater competition than we have at present.

759. Do you think that, in consequence of the gate being there, it prevents competition, and so lowers the value of property on the other side of the gate?—Just so.

760. Do the houses immediately on the London side of the gate let very easily?—Yes; they bear a very much higher rental; considerably higher.

761. Are you or not aware whether the parish are willing to take the expense of the roads upon themselves if the gate were removed?—I am not in any way connected with the parish; I know nothing whatever about parish matters, and therefore I cannot answer that question. But I think it a very hard case that we should be asked to take the road upon ourselves, and call upon us to pay the cost of maintaining the road in Paddington; and therefore by calling upon us to pay the expense of keeping the road in order by the removal of the turnpike, when there is one already which answers every purpose, for it is quite impossible to avoid the turnpike where it is now placed, it being placed on the other side of the railroad. The loss of toll by the removal of our gate would be somewhere about 2,000 *l.*

762. Colonel *Pennant.*] When you speak of the existence of the gate lowering the value of property beyond it, do you mean that the value of the property beyond the gate is lower than it was some years ago?—I only speak of seven years' experience.

763. Do you mean that the value of property beyond the gate is lower than it was seven years ago?—We do not get the rentals that we did then.

764. Mr. *MacGregor.*] Do you mean to convey that the persons who passed through the gate shuddered at the gate, or at the toll they had to pay?—They shuddered at the idea of passing with their families through the turnpike in consequence, I imagine, of the language which they must hear oftentimes in passing.

765. Whom from?—From the bystanders.

766. Mr. *Hildyard.*] Does that gate differ from other gates in that respect?—I cannot tell you that. I am speaking solely of Notting-hill.

767. Are we to understand you that the consequence of the existence of the toll-gate is to call into being such a brutal population, that persons with females shudder to pass through the toll-gate?—The general population may be refined which exists there, but you may have idlers about who may amuse themselves by acting in a manner which the bulk of the population would not think of doing.

Mr. *R. T. Swain.*

24 June 1856.

768. Is that the case at Notting-hill in particular, or is it the necessary consequence of the existence of a toll-gate anywhere?—I presume it is a necessary consequence.

769. Why would you think it very hard to have the cost of maintaining that road cast upon the parish?—For this reason: we should be doing it to relieve Paddington; and Paddington has now become a block of most wealthy property, and it is their road, and only their road, which runs nearly to the gate.

770. And you presume that that would be the feeling, probably, of other inhabitants of your district; that they would object on the ground you state to have the road cast upon the parish if the bar were removed?—I do not know; it is very probable.

771. Supposing that bar were removed, and 2,000 *l.* lost to the Commissioners, you think it would be a grievance that that should be levied upon the parish of Notting-hill?—Yes, because it would be for the relief of Paddington.

772. Do you think that would be the general feeling of the inhabitants?—I think that is the common-sense view of it.

773. Sir *Benjamin Hall.*] Do you mean to tell the Committee that the toll-gate at Notting-hill is a rendezvous for improper characters who assemble there?—No; but a number of idlers will naturally hang about a turnpike.

774. So that every turnpike-gate is a house of call for improper characters?—Situated as that is in the centre of the town.

775. What other toll-gate is there where improper characters congregate?—This turnpike is peculiarly situated, because the road is so very narrow, and the traffic is very great indeed; it is the only spot where they can possibly congregate just there.

776. What particular inducement is there for improper characters to congregate at the turnpike-gate?—The inducement which all turnpikes give to idlers, the same as they do outside public-houses; I cannot give you any other explanation than that; there is always something to excite curiosity at turnpikes.

777. Mr. *Butler.*] You think the parish beyond would not like the toll-gate done away with, but if it were possible to do away with all tolls, and for the maintenance of the roads to be thrown upon the parishes, I presume that would alter your view?—Perhaps I am not called upon to give my opinion; but we do not ask for the doing away of the turnpike; the turnpike we have now, within half a mile of this one, answers all our purposes, and according to the calculation and showing of the Commissioners themselves, it would only be a loss of about 2,000 *l.*, and I feel that they have now arrived at that position that they can let us have relief; it is a crying evil I can assure you; it is as great a blight as can possibly be upon the property at Notting-hill. If such a thing were practicable, the owners of the property would subscribe and pay the management of the roads themselves rather than suffer it to be there.

778. Do not you think in other places those gates are a grievance?—Yes, but this is so situate, that you cannot take a ride or drive in the park without paying the toll.

Mr. *Joseph Pattisson,* called in; and Examined.

Mr. *J. Pattisson.*

779. *Chairman.*] ARE you the Surveyor of the parish roads in Chelsea?—I am.

780. How long have you held that office?—Ever since September 1845.

781. You held that office, then, before the toll-gates were removed out of Chelsea parish, did you not?—The toll-gates were removed at the passing of the Improvement Act in August 1845, but I was appointed in September, consequently the toll-gates had ceased as toll-gates, although they were not pulled down.

782. You are well acquainted, then, with the condition of the roads and the condition of the parish at the time the toll-gates were pulled down?—I am.

783. Is it your opinion that the roads are in as good a condition now as they were then?—Considerably better.

784. Do you know what it was supposed the additional rate in the pound would be which would be imposed upon the parish when they took to those roads?—I cannot say as far as regards the abolition of the tolls; but our extra rate,

rate, what we may term the improvement rate, was 6 *d.* in the pound beyond what the highway and lighting rate used to be.

785. Do you mean to say that taking the roads cost 6 *d.* additional rate in the pound to the parish?—No; that 6 *d.* in the pound went to additional matters; to repair other roads as well as lighting.

786. Are you able to give to the Committee the amount of extra rate which taking these roads imposed upon the parish?—I am not aware of that.

787. You are not aware, inasmuch as the rate is mixed up with several other things?—It is.

788. What other things are there mixed up with it?—Paving, lighting, cleansing, and watering.

789. Do you know how much the lighting costs out of that 6 *d.*?—We calculate it about 6 *d.* for the lighting.

790. The whole rate I understand you to be only 6 *d.*?—No, the improvement rate is 1 *s.* 6 *d.*; we call it 6 *d.* for the lighting, and 6 *d.* for the improvement, and 6 *d.* for the highways; that was the way we divided it.

791. And that 6 *d.* is for the expense of the entire highways in the parish of Chelsea?—Yes.

792. For what length?—About 23 miles.

793. Can you tell the Committee what the length of road is which was formerly repaired by the Metropolis Commissioners?—It might be about 2 ¾ miles; from that to three miles; I am not quite sure.

794. Can you ascertain what it was?—I can.

795. Will you send a statement of that to the Committee?—I will.

796. You say that the roads are much better than they were; has the parish much increased in population since that time?—Very considerably.

797. Can you tell us at all what the effect of removing the gate was in the immediate neighbourhood in which that gate was situate?—I have heard the inhabitants express their approval of the removal of the gates as well as the other powers connected with the Improvement Act.

798. You cannot give the Committee any distinct evidence as to what the state of the property in the immediate neighbourhood of the gates was before the gates were removed?—I do not think there is any alteration in that particular part of the parish where the gates were; an improvement in the property in the parish has taken place in other portions.

799. I think a portion of the roads in Chelsea is still maintained by the Metropolis Roads Commission, is there not?—So much of the Fulham-road as lies between the Admiral Keppel and Stamford-bridge.

800. What is the distance?—About a mile and a quarter; half of it is in Kensington and half of it is in Chelsea; the parish boundary is in the centre of the road.

801. Mr. *Hildyard.*] Is that portion which is still maintained by the Metropolitan Commissioners of Roads a more expensive portion than any other portion of road in the parish?—No, I should say not; I should say that the traffic upon the King's-road and the Fulham-road is about equal; there is about as much traffic upon the King's-road as there is upon the Fulham-road.

802. A great number of omnibuses travel between the Admiral Keppel and the Fulham-road?—Yes.

803. Is that a very expensive description of traffic?—It is the same in the King's-road; in the King's-road they run every 10 minutes.

804. What was the reason that the arrangement was made, that when the parish took those roads upon themselves that portion was left to the Commissioners?—The Act of Parliament specially provided for that.

805. Do you know upon what ground?—I do not.

806. *Chairman.*] Was it from the fact that there were no houses there at that time?—There were houses there.

807. Mr. *Hildyard.*] A part of the expense of maintaining the roads in that parish is defrayed by the metropolitan trust, is it not?—Yes, the Fulham-road.

808. Any of the roads in St. Luke's, Chelsea, for instance?—No; the remainder are repaired at the expense of the vestry, except the Harrow road.

809. I think there was a Hans Town rate, was not there?—Yes.

810. That district which was maintained by the Hans Town rate is now maintained by the Metropolitan Board, is it not?—Yes.

811. Sir *John Shelley.*] What Board do you refer to?—The vestry Board.

Mr. *J. Pattisson.*

24 June 1856.

812. That is the district Board?—Yes.

813. Mr. *Hildyard.*] Has the consequence of that change been to raise the rate from a sixpenny to a ninepenny rate; the very first rate that has been imposed?—The rate is increased under the new vestry. I do not know what it was under the old commission.

814. Has it increased in the proportion I speak of, from 6*d.* to 9*d.*?—I think the increase is 2*d.* above it used to be.

815. Mr. *H. Russell.*] Is that increase consequent upon the taking to the metropolitan roads?—We have not taken to any metropolitan roads since the passing of the Act of 1845.

816. Have the inhabitants generally complained of any extra rate being levied for the maintenance of those roads?—At first, when the Improvement Act was passed, there was certainly a great deal of grumbling; but when the Commissioners commenced their operations and carried them out the parishioners were very well satisfied with what they were doing, and the owners of property within the parish expressed themselves very well satisfied with the Improvement Act and its operations.

817. Sir *William Jolliffe.*] That Improvement Act caused a rise from 1*s.* to 1*s.* 6*d.* in the rates?— Yes; but the consequence was, that the land was thrown open for building purposes, and there has been a great deal of building since that time.

818. That was occasioned by the removal of the turnpike-gate?—Partly from that circumstance, and partly from the operation of the Improvement Act itself; by the paving, lighting, and other things, the property got let extensively.

819. So that the inhabitants generally are satisfied with the increase of rate on account of the improvements?—They were satisfied on account of the improvement of their property.

820. Since the Act of last Session an increase of 2*d.* has taken place?—Yes; it is 1*s.* 8*d.* for other purposes, and I think it is only 2*d.* or 3*d.* for the sewers; I forget precisely, but at all events it is an increase of 2*d.* on what it used to be.

821. Is not it in consequence of the sewers being placed under this Board that there has been this increase of 2*d.*?—No doubt.

822. Then the inhabitants generally of the parish being satisfied with this Improvement Act, what class of persons within the parish do you suppose are most benefited by the improvement that has taken place?—The inhabitants generally, and also the owners of houses; because it has raised the property in value by the improvements.

823. Do you think the owners of property have benefited to a greater extent than the inhabitants?—I think they have both benefited in proportion.

824. Do many omnibuses run through the parish; have you a large omnibus traffic?—The omnibuses run every 10 minutes, from the "World's End," through the parish, along the King's-road, and up Sloane-street.

825. Have the fares by those omnibuses been reduced since the removal of the gate?—I believe there has been a reduction in the fares of the omnibuses lately.

826. *Chairman.*] By the greater competition, is it not?—It arises from that.

827. Sir *William Jolliffe.*] More than from the removal of the gates?—Yes.

828. In what way do you repair the roads; are they gravel roads or granite roads?—Some are granite and some are not.

829. Were they repaired with granite before the roads were taken by the parish?—Yes, partially.

830. Do you continue to incur the expenditure of granite upon your roads?—We do.

831. Do you find that the most economical to meet the traffic?—It is the cheapest in the end.

832. Mr. *Alcock.*] Do you think if it were proposed to the parish of Chelsea to replace the toll-gate, to get rid of the expense of keeping up the roads, that the parish would be likely to entertain the idea?—I do not think they would.

833. You think they are better pleased by having no tolls?—They are; they would offer an opposition to the proposal directly.

834. Mr. *Butler.*] What is the cost of the granite to the parish of Chelsea?—The granite is bought in lumps by the guardians, and delivered into their yard at 10*s.* 5*d.* a ton.

835. What

835. What does it cost in spreading?—The vestry pay in fact 12 *s.* 6 *d.* a ton to the guardians for it.

836. Sir *John Shelley.*] You pay the 2 *s.* 1 *d.* for breaking, in short?—That is what it comes to; it would cost them from 9 *d.* to 1 *s.* a ton spreading.

837. Sir *William Jolliffe.*] Is the granite broken by the paupers?—It is.

838. Sir *John Shelley.*] What does it cost per ton to break by pauper labour?—Two shillings and a penny.

839. Mr. *Hildyard.*] Making 12 *s.* 6 *d.* for the broken granite?—Twelve shillings and sixpence.

840. Mr. *Butler.*] Is that the course usually pursued by the metropolitan parishes, that granite is taken in its whole state to the yard, broken by the paupers, and then in some cases sold to the Commissioners of the Metropolis Roads?—I cannot answer the question whether it is universal in other parishes in London, but it is in many cases I know.

841. Mr. *Alcock.*] Has the number of omnibuses increased since you took the roads in your own hands?—Yes.

842. The public conveyances have increased?—Considerably increased.

843. Are they cheaper than they were formerly?—Yes.

844. Mr. *Wyvill.*] Is the King's-road in as good repair as the metropolitan road to Fulham?—It is generally, except just now, for this reason, that we have lately had a sewer put down upon a portion of it, and also a two-feet main belonging to the Chelsea Waterworks; consequently it cannot be in that good repair as if the ground had subsided and settled; but it was before they disturbed it.

845. Sir *John Shelley.*] Has this increase in the omnibus traffic taken place lately?—It has been gradual.

846. Did you find a great increase, or any increase, at the time the tolls were taken off, or has it been gradual?—It has been gradual; it has been through the increase of the population, I anticipate.

847. Mr. *MacGregor.*] Is the length of the roads 23 measured miles?—Twenty-three miles, as near as possible.

848. Have you any account of the assessment to the poor-rate in the parish of Chelsea?—The assessment to the relief of the poor in 1844 was 128,138 *l.*; the assessment to Lady-day 1856 was 201,196 *l.*

849. It is upon the 201,196 *l.* that the 6 *d.* is levied?—Yes.

850. Mr. *Hildyard.*] How do you calculate the 2 *s.* 1 *d.* as the cost of breaking granite by the paupers; what is the basis?—That is the return given to me by the Board of Guardians themselves; it is what I asked for. The guardians buy it at 10 *s.* 5 *d.* a ton delivered into their depôt, and they pay 2 *s.* 1 *d.* per ton for breakage; consequently they sell it to us for 12 *s.* 6 *d.*: there is no profit; it is merely the prime cost.

851. How do they ascertain the cost of the pauper labour in breaking the granite?—It is put at 2 *s.* 1 *d.* without profit.

852. You do not know upon what calculation that is made; how that is ascertained?—I do not know how the guardians calculate it, but that was their return to me when I asked for it.

853. Mr. *Alcock.*] Do you know the cost of the 2¾ miles that were turnpike before?—No, I do not.

854. What do your 23 miles cost you?—We put it down at about 300 *l.* a mile for the repair of the roads.

855. And for lighting?—No.

856. Not more than that?—No, that is it; we have gone into the calculation, and 6,800 *l.* is what we put it down at.

857. Mr. *J. MacGregor.*] Is that for the highway?—Yes.

858. That does not agree with your figure of 6 *d.* in the pound upon 201,000 *l.* assessment?—That is the return from the guardians of the assessment, and this is the amount which the vestry have made for repairing the roads; but this does not include lighting. This 300 *l.* a mile does not include the lighting, nor it does not include sundries.

859. Sir *John Shelley.*] Does it include the watering?—It includes the watering, the cartage, the labour, the paving, and other materials.

860. You divide 1 *s.* 6 *d.* into three items?—Yes; that was the old amount under the late Improvement Act.

Mr. *J. Pattisson.*

24 June 1856.

861. But are you correct in saying 6 *d.* in the pound is the amount you spend upon the highways?—I think it is thereabouts; I will not be positive.

862. That makes a sum of 5,200 *l.*?—It may be more; I know we have set aside the sum of 6,800 *l.* for those repairs.

863. Mr. *Alcock.*] Then you cannot at all say what difference there is between the ordinary roads and those that were turnpike-roads originally?—No, I cannot.

864. Sir *William Jolliffe.*] Can you state what the amount of the highway rate was in the parish before 1845?—No, I cannot.

865. Perhaps you will ascertain that; the last highway rate was, I suppose, collected previous to the Improvement Act?—Yes.

866. Will you ascertain what the amount of that rate was?—The amount in the pound?

867. The amount in the pound?—I can ascertain what that was.

868. Mr. *Alcock.*] What is the width of the old turnpike-road?—It varies.

869. It is a very narrow road altogether, is it not?—It is not a wide road at all.

870. The whole of it is too narrow in Chelsea altogether, is it not?—It would be much better if it were wider.

871. *Chairman.*] You will, perhaps, be prepared to answer these questions on Thursday next?—Yes.

872. Mr. *Butler.*] Was any addition made to your staff when you took possession of the additional 2¾ miles of metropolitan road?—I cannot say, because I took it up at the Improvement Act, and took it out of the hands of the surveyors of highways; therefore I do not know what staff they had: of course I appointed my own staff under the powers of the Act.

873. You know what the cost of your own staff is; can you bring us the information on Thursday. I want to know whether any addition was made to the staff when you took the additional 2¾ miles of road?—I do not know how we can answer that question, because I do not know what staff the surveyors of highways had; but there is sure to have been an increase of staff, because of the improvements which were going on; as soon as they commenced, we must have increased the staff.

874. *Chairman.*] Before that Chelsea Improvement Act was passed, some of the roads, and especially the lanes in Chelsea, were in a very bad state indeed, were they not?—Yes, the Commissioners raised the parish out of the mud, you may say.

875. So that a comparison of what they were before and what they were afterwards can afford no ground in guiding the Committee to a judgment as to what might take place, supposing a parish where the roads were well managed were to take to the roads of the metropolis which passed through them?—Certainly not.

876. Colonel *Pennant.*] Was any portion of the roads made in the first instance by speculators in building?—Some of them have been made since the passing of the Act; the new streets that have been made since the passing of the Act have been of course formed by the builders in the first instance.

877. Then the parish were not at the cost of making those roads?—No, they were delivered over to them after they were made.

878. Mr. *MacGregor.*] Which Commission raised the parish out of the mud?—The Commission under the Act of 1845.

879. Is the 300 *l.* per mile, which you estimate to be the cost of maintaining the roads, founded upon figures of your own combining, or is it merely placed in your hands as an estimate?—I take it from the amount which the vestry have declared in the money which they have set apart for the different things for the next twelve months; the amount set apart for paving materials, labour, carting, and watering is 6,800 *l.*

880. Are the accounts of the maintenance of the highways in Chelsea kept under your own superintendence?—They are.

881. You know, then, what the cost was in the last 12 months?—Yes, up to March.

882. What was it in the last 12 months?—I cannot tell unless I refer to the accounts, which are not here; up to last March twelvemonth our returns were made.

883. Mr. *Hildyard.*] On Thursday will you be prepared to answer the question

Mr. *J. Pattisson.*

24 June 1856.

question whether in St. Luke's, Chelsea, the highway rate has not been increased for the present half-year from 6 *d.* to 9 *d.* ?—I will.

884. Sir *William Jolliffe.*] Have you furnished the vestry with an estimate of the cost for the coming 12 months?—The committee of the vestry and myself went into the question, and we found that was about the sum we wanted, compared with other sums we have expended, taking, for instance, the last 12 months as the basis.

885. Sir *John Shelley.*] To report to the vestry, you must have had some data to go upon?—That was from their report; there may be an omission in it, but I know the figures were correct; there may be an omission somewhere or other.

Mr. *Augustus Lines*, called in; and Examined.

Mr. *A. Lines.*

886. *Chairman.*] WHAT are you?—I am an Omnibus Proprietor.

887. Are you the proprietor of a line of omnibuses, or are you engaged in more lines than one?—More than one; and I am also one of the district managers of the London General Omnibus Company.

888. Of what line?—The Camden Town district more particularly.

889. Are those different lines very unequally affected by the tolls?—There are five different lines of omnibuses that go nearly to the same point; at least, pass in the same district; namely, the Waterloo, the King's Cross, the Camden Town, and the Kentish Town and Highgate, and the Hampstead. I believe there are 79 omnibuses.

890. What does the Waterloo pay?—The Waterloo pays nothing on that district.

891. Where does the Waterloo go from?—From the York and Albany, to Regent-street and Charing Cross.

892. That pays no toll?—That pays no toll.

893. What does the King's Cross pay?—The King's Cross goes from the Eagle at Camden Town; it pays no toll; it goes nearly parallel with the turnpike-road out at Euston-square into the New-road, and from thence to King's Cross, avoiding the toll entirely, except a few that belong to one of the contractors for the toll, which I believe pass through the toll sometimes, or perhaps generally.

894. What do you mean by "a few"?—One of the proprietors has that district of tolls, which is Mr. Bolton; I believe his omnibuses go through the toll-gate; the other proprietors do not.

895. Do his omnibuses pay any toll?—That I am not aware of, of course.

896. Then the third class, the Camden Town, what do they pay?—They pay 4 *l.* a week; there are 19 of them; the reason they are paying so small a sum is this; I believe their amount of toll would be something like 56 *l.* a week; but by not going through the gate it could not hinder them two minutes on their journey to avoid the toll altogther; therefore they pay that nominal amount rather than be sent out of the way just to show other people the way to avoid the toll.

897. Then the next is the Hampstead; what do they pay?—The Hampstead would pay the same toll which they now pay provided that gate was removed; so would the Highgate-hill.

898. What gate would they pay at?—At the gate they pass through; one is near the Assembly House at Highgate, and the other is on Haverstock-hill.

899. Does one gate free the other?—One gate frees the other.

900. That is all in one district?—That is all in one district; therefore there are about 79 omnibuses which really only pay from that gate, being there 4 *l.* a week.

901. Do you mean to say that the Hampstead omnibuses only pay 4 *l.* a week?—Yes; if the gate was away the remainder ones would pay just the same toll as they do now.

902. If what gate was away?—The Hampstead-road gate; the middle gate at Mornington Crescent; if that gate was removed the whole of those omnibuses coming from Hampstead to Oxford-street, taking that district coming into London, those 79 omnibuses would pay precisely the same toll they do now, barring the 4 *l.* a week.

Mr. *A. Lines.*

24 June 1856.

903. What do they pay now?—Eleven of them pay at the extreme point, at the Assembly House gate, I believe, 1 *l.* or a guinea per week, and the Hampstead pay 1 *l.* or a guinea per week each; that is, Hampstead 13, and Kentish Town 11.

904. But all of them do not go past the Assembly House gate, do they?—No, there are 11 of them go there, and 13 of them go through Haverstock-hill gate; the contract is 1 *l.* each; they all pass through Mornington Crescent gate; at least those two districts do.

905. Sir *Benjamin Hall.*] How much do the 11 pay, and how much do the 19 pay?—The same.

906. How much do the 30 pay, altogether?—On the whole of the distance the 13 and the 11 pay 1 *l.* each, but they pass through this Mornington Crescent gate while the other omnibuses contract for 4 *l.* each, because they could avoid that gate; if that gate was removed altogether, the toll upon those 13 and 11 would be precisely the same as it is at the present time.

907. *Chairman.*] The others would escape?—The others could escape altogether if they pleased.

908. They could escape now, but they do pay 4 *l.*?—Yes.

909. Sir *John Shelley.*] Are the owners of those omnibuses who pay the 4 *l.*, for the purpose of not showing the way round, to avoid the gate, the lessees of those tolls?—I think not.

910. Are you sure they are not?—I am not sure, but I believe they are not.

911. *Chairman.*] The Kentish Town line, what do they pay?—The Kentish Town pay either 1 *l.* or a guinea a week; that is the Kentish Town and Highgate; they pass through this gate, but one gate clears the other; they must pass through the further gate, and therefore they pay either 1 *l.* or a guinea per week.

912. Sir *William Jolliffe.*] Are all those payments arranged by contract with the lessees?—I believe they are. These are all contracts that I am speaking of.

913. Sir *Benjamin Hall.*] It appears from the answer you have given to the Chairman that there are five lines of omnibuses, viz. the Waterloo line, the King's Cross, the Camden Town, the Hampstead, and the Kentish Town; that on the first two of those lines, that is the Waterloo and King's Cross, there is no toll whatever taken; and that on the Camden Town line there is a nominal toll of 4 *l.*; is that the case?—That is correct.

914. What are the fares of the passengers on the Waterloo line?—From their starting point, three fourpences; they are divided into distances; three fourpences, or 6 *d.* the whole distance; it is about three miles from the starting point to Waterloo Bridge, which is 4 *d.*; from Regent Circus to the railway station is 4 *d.*

915. What distance is that?—I think that is between two and three miles; and from Charing Cross to Camberwell gate is 4 *d.*

916. What distance is that?—I suppose it would be about three miles.

917. Now take the second line of omnibuses, from King's Cross; no toll is taken there?—No toll is taken there.

918. What are the charges for passengers?—They are divided, but I am not thoroughly acquainted with all the divisions; a portion of them is 3 *d.*; they are divided something in the same manner, but I cannot give you their table of fares; I have not it with me, and I do not recollect it exactly; but I believe a portion of theirs is 3 *d.* and the other 4 *d.* and 6 *d.*, I think, the whole of the distance. I believe they have three portions.

919. There is one distance, then, that pays 3 *d.*, another pays 4 *d.*, and another pays 4 *d.*?—Yes.

920. But taking it for the whole line it is 6 *d.*?—Yes.

921. Now come to the Camden Town district, what are the charges upon that line?—The Camden Town district is 3 *d.* the whole distance.

922. What is the length of the distance?—The length is 2¼ miles, and the outside fares are divided; for about half way they pay 2 *d.* each.

923. Then the Hampstead line, what are the charges there?—The Hampstead has also several fares; it is 4 *d.* from Hampstead to Camden Town.

924. What distance is that?—Under two miles I should think, and 6 *d.* to Oxford-street; the whole distance is 9 *d.*

925. What is the length of the whole distance?—I forget whether it is 5¾ miles; I think it is; or 5½ miles; I forget exactly; it is from 5½ to 6 miles.

926. The

926. The Kentish Town and Highgate, what are the charges?—They are about the same in distance, that is, 4 *d.* from Highgate to Kentish Town.

927. What distance is that?—About the same as the Hampstead, about two miles.

928. And the next?—Sixpence the whole distance, I believe, the Kentish Town is.

929. When were the tolls taken off the line upon which the Waterloo omnibuses go?—They do not pass through the toll, they go by the side of the toll-bar.

930. They never did go through?—They never did go through.

931. On the King's Cross line did they ever go through the toll-bars there?—I rather think they did, but I am not quite sure; they have not since I have had to do with them; it is some years back if they did.

932. Do you know what the charges were at that time?—I am not quite sure whether there was a division of the fares or not, or whether they were 6 *d.* altogether.

933. On the Camden Town you say they pay a nominal sum of 4 *l.*?—Yes, a nominal sum.

934. When did that payment commence?—It was 6 *l.* some time back, but it has been a nominal toll for a very long time.

935. Has there been any diminution of charge upon the Hampstead line in tolls?—I think not.

936. Has there not been any gate taken off?—There has been no gate taken off, but I believe all that district was reduced a third some time back.

937. Sir *William Jolliffe.*] Was not it reduced last year one-third?—I think it was.

938. Sir *Benjamin Hall.*] Has there been any reduction in the charges for the passenger traffic?—Not that I am aware of.

939. On the Kentish Town and Highgate has there been any alteration in the charges?—None whatever that I am aware of.

940. Has there been any alteration in the tolls?—In some districts; but those omnibuses contracted the same then as they do now; therefore I do not know that I can say there was any reduction upon those omnibuses.

941. Sir *William Jolliffe.*] Was the contract the same last year as it is this?—I believe it was.

942. Mr. *Alcock.*] You say, by reason of the opportunity of going round and avoiding one particular gate, you are able to make a contract with the lessees of the tolls by which you save 52 *l.* a week; you pay 4 *l.* instead of paying 56 *l.*; is that so?—Yes.

943. Do you do this at other gates also to a considerable extent?—The King's Cross gate might be avoided altogether, by crossing the trust and going a very few yards out of the way.

944. What difference would it make to you per week if you paid the full toll?—I do not know what the toll would be.

945. *Chairman.*] The King's Cross omnibuses do not go through any gate?—They do not.

946. Mr. *Alcock.*] Fifty-two pounds a week would be about 2,500 *l.* a year; there would be an additional toll of 2,500 *l.* a year but for one single evasion; you are speaking of one single line of omnibuses; that would be one item; are other things to the same extent?—I believe the whole of the railway traffic avoids that toll; all the heavy goods traffic from the railway station.

947. All that might be prevented if the Commissioners thought proper to put up bars, I suppose?—They must put up a very great many bars; I suppose something like 100 of them; there are so many little streets in that neighbourhood.

948. Sir *Benjamin Hall.*] In point of fact, whether there are tolls, or whether there are not tolls, the cost for the passenger traffic is very much the same?—I do not think tolls have so much influence upon the price of the passenger traffic as they have upon the convenience of the neighbourhood, or the supply that is given to the neighbourhood of omnibuses.

949. Sir *William Jolliffe.*] Do you consider that the nominal toll which these omnibuses pay is entirely occasioned by the power of evasion which exists as to those gates; take the Camden Town line, for instance?—I think they could

Mr. *A. Lines.*

24 June 1856.

evade the toll entirely, and therefore the lessees prefer taking a nominal toll to letting them be evaded altogether.

950. Is there not one lessee of one set of tolls who is an omnibus proprietor himself?—Mr. Bolton is connected with omnibuses and with the King's Cross line; but his omnibuses, I believe, go through the toll-bar.

951. Toll-free?—I do not know, of course.

952. He makes no contract, in fact?—There is no contract with that gate.

953. You are speaking of those lines that have contracts with the lessees?—I am speaking of the Mornington Crescent gate at the present time.

954. Of the arrangement which is made between the omnibus proprietors and the lessee?—Yes.

955. You have said that the Waterloo line passes through no gate?—Upon that district.

956. No gate at all?—They pass through the bridge gate in the middle of their journey.

957. They pay no toll?—They pay a toll upon the middle of their journey, but not upon that district.

958. That is the Waterloo line?—Yes.

959. How far do they travel over the roads that the Metropolis Commissioners repair?—I rather think it is the Woods and Forests road more particularly which they travel over; they travel from Regent-street to the York and Albany. I think the greater portion of that is in the hands of the Woods and Forests. I suppose that would be about 2 ½ miles.

960. Does the Waterloo line pass over any part of the road that is repaired by the Metropolitan Roads Commissioners?—I am not sufficiently acquainted with what the Commissioners do repair, to answer that question.

961. Does the King's Cross line pass over any road which the Metropolitan Commissioners repair?—I think they are very much parish roads.

962. Mr. *Hildyard.*] You stated that there was one gate that might be removed without loss of revenue to the Commissioners on that line?—As far as those omnibuses are concerned.

963. Just point it out on the map?—(*The Witness pointed out the same*).

964. That is a gate which you believe, as far as regards revenue derived from omnibuses, might be removed by the Commissioners without loss?—Yes.

965. Because they would get the toll that is levied upon that gate upon the gate beyond; is that your reason?—There are 24 omnibuses upon that line; 13 and 11 which pass through those other two gates and pay a toll.

966. Is it your deliberate opinion that there might be that convenience, so far as the omnibuses are concerned, by the removal of that gate, without loss to the revenue of the Commissioners?—It is.

967. Is it your deliberate opinion that if that gate were removed all those omnibuses that now pass through the second gate would continue to do so?—I think so.

968. It is your deliberate opinion that every omnibus that now passes through those two more remote gates would continue to do so if the first gate were removed?—Yes.

969. Now your reason?—Thirteen of them go to the town of Hampstead; that gate is situated upon Haverstock-hill, which is certainly a most awkward place; the supply of passengers is from the town of Hampstead; therefore, if they did not go to Hampstead, they would not get their passengers at all; they cannot get to Hampstead without going through that gate; if they did not go through they would lose their trade entirely.

970. Is it a thickly peopled district that lies between the two gates?—Yes, I think so.

971. Do you think that the same number of omnibuses that now pass through this lower gate would continue to pass through this other gate, or would a portion of them stop short of that point, having accommodated the intermediate district?—If any portion stopped, it would be a very small portion, at any rate.

972. Would there be any portion stop short?—I cannot say that; but in explanation of my answer to the question as to whether it is a very thickly populated neighbourhood, it is not so thickly when I come to think of it. From where the Yellow Camden Town omnibuses start, to that gate, all one side of it, pretty well, is the railway station; therefore it is not altogether so thickly peopled a neighbourhood as at first glance I thought I might consider it to be.

973. Now,

973. Now, having reconsidered it, I want your careful opinion as to whether the whole number of omnibuses that now run through the first gate would continue to run through both gates?—I think they would; it is my decided opinion they would.

974. *Chairman.*] Probably others would also start from the intermediate place?—Very likely.

975. Mr. *Hildyard.*] Assuming that the tolls were taken off, do you believe that the effect would be to put that money into the pockets of the omnibus travellers, or would all or any portion of it go into the pockets of the omnibus proprietors?—There is none to put.

976. Then assuming that tolls were abolished generally, what is your opinion as to the effect upon omnibus proprietors and omnibus travellers; would the omnibus proprietors get the whole, or any portion of the toll, or would the whole be remitted to the public who travel by omnibuses?—I do not understand the question; I do not understand what gate you are alluding to.

977. We have been told that 26,000 *l.* a year, as a rough estimate, is paid by omnibuses in the shape of tolls; assuming we were to abolish toll-gates, would that 26,000 *l.* a year go into the pockets of the public who travel by omnibuses in the shape of an abatement of the fares, or would the whole or any portion go into the pockets of the omnibus proprietors, in your judgment?—It is my decided opinion that the removing of gates removes the restriction to communication with a neighbourhood; the consequence is, that the neighbourhood becomes very greatly improved, and very much built upon; the rental becomes very much increased; and the consequence is, a very great improvement to the neighbourhood generally.

978. But you must see that that is not an answer to my question; I want to know what, in your opinion, would become of the 26,000 *l.* a year that would be abolished in the shape of tolls; would it go to the public, or would it go to the proprietors, or would it go partly to one and partly to the other?—I should think it would be very generally distributed.

979. What do you mean by that expression; that one-half would go into the pockets of the omnibus proprietors, and the other half into the pockets of the public, or what is the meaning of those words, "very generally distributed"?—I have before said that the improvement in the neighbourhood where they were removed would be so great, that the public would derive a very great benefit from it.

980. I am not speaking of the incidental consequences; I want to know what would become of the money that is now levied in tolls?—It is a point which I am not certainly mathematician sufficient to solve.

981. *Chairman.*] An omnibus company is a commercial speculation, is it not?—Yes.

982. And like all other commercial speculations, I presume, they try to get as much as they can, do not they?—No doubt.

983. And endeavour to make their speculation answer as well as they can?—Yes.

984. And if 100,000 *l.* per week were taken away, you would be very glad to put it into your own pockets, if you could?—No doubt of it.

985. Mr. *Hildyard.*] A reduction has been proved to have taken place from 3 *d.* to 2 *d.* upon one of the gates, and there has been no reduction of fares to the public in that instance, therefore what has been lost there in the shape of toll has passed into the pockets of the omnibus proprietors, has it not?—I do not think in that case, as I have before said, that the toll has so much to do with the price at which the passenger rides as it has with the accommodation the neighbourhood gets in the way of carriages; if a toll is removed, generally speaking, there is an increase of carriages, people get a better supply to the neighbourhood, and although it may appear that the toll is saved to the proprietors, it is generally reduced down again to something about the same margin; competition generally brings it back to something about the same point.

986. Sir *John Shelley.*] But if a large increase in omnibuses takes place, and a reduction of toll at the same time, the increase in the profit to the omnibus proprietors is so much the greater by the reduction of the toll?—That is presuming you get as much per carriage as you did before, which I think you cannot presume to be the case.

Mr. *A. Lines.*
24 June 1856.

987. But you cannot show that any reduction of rate to the public has taken place where tolls have either been taken off entirely or reduced, can you?—No, I do not know that I can positively.

988. Then, in fact and in truth, the whole of the reduction of the toll goes in favour of your profits?—As the object of all business of course is profit, if you have more carriages than pay their way, they become reduced; if by tolls or other matters the expenditure is swelled up too much, they become diminished. They are regulated according to the supply and demand, generally speaking; not always so, but generally.

989. Mr. *Hildyard.*] Have you made a calculation as to what rate, per omnibus or per mile, the tolls which you pay amount to; are you able to state that?—No, I am not; the fact is, my omnibuses pay no tolls at all.

990. But I refer to the omnibus traffic that does pay toll; are you able to say after what rate per mile the tolls impose a duty upon the omnibuses?—No, I am not.

991. Sir *John Shelley.*] As you are so fortunate as not to pay toll for your omnibuses, do your omnibuses carry the passengers at a cheaper rate than the omnibuses that pay toll?—There is very little difference.

992. Is there any difference in favour of the public as regards your omnibuses in that respect?—I am not aware of any.

993. Mr. *Alcock.*] Can you tell me what proportion of the whole expense of keeping omnibuses may be put as toll in a general way; is it five per cent. or 10 per cent.; suppose it cost 300 *l.* a year, or any other sum, to keep an omnibus, what per-centage would the toll be upon that?—It would be a small per-centage.

994. Five per cent.?—It would not exceed five, I should think; I have not made a calculation; but forming a rough estimate, I should think it would not be more.

995. Mr. *James MacGregor.*] Your omnibuses do not pay toll?—My own private omnibuses do not.

996. But you are the director of other people's omnibuses, which do pay toll?—Yes.

997. How long have those omnibuses been established?—Nearly six months.

998. You have not yet returned an account to your proprietors of the actual proceeds?—I have not.

999. Can you put in an account of the toll paid by the omnibuses of which you are director?—As far as my district is concerned, I could.

1000. But of that company altogether?—I am not in a position myself to put in that account.

Mr. *James Fawcett,* called in; and Examined.

Mr. *J. Fawcett.*

1001. *Chairman.*] DID you take the traffic that passed through Regent-street on Saturday the 21st of June 1856?—Yes.

1002. From what hour till what hour?—From 12 o'clock on Friday night till 12 o'clock on Saturday night.

1003. During that time, how many omnibuses, cabs, two-horse carriages, one-horse vans and carts, one-horse carriages, and other vehicles passed; will you state what the whole traffic was?—This is my return (*producing the same*).

1004. State from that paper to the Committee what the traffic was?—1,538 omnibuses, 4,853 cabs, 1,134 two-horse carriages, 1,138 one-horse vans and carts, 1,439 one-horse carriages, 194 two-horse waggons and carts, 34 three-horse waggons and carts, nine four-horse waggons, and 196 saddle horses.

1005. Making a total of how many?—10,535.

1006. Mr. Alderman *Challis.*] In 24 hours?—Yes.

1007. Mr. *James MacGregor.*] What staff did you employ to take this traffic; did you take it all yourself?—Yes, that return I did.

1008. By whom were you employed?—Mr. Bradfield.

1009. Who is Mr. Bradfield; a private gentleman?—Yes.

1010. What profession is he?—I do not know.

1011. Was he a private person who employed you?—Yes.

1012. Mr. *Hildyard.*] Is he an omnibus proprietor?—No.

1013. Mr.

Mr. *Henry Gill*, called in; and Examined.

Mr. *H. Gill.*

24 June 1856.

1013. *Chairman.*] DID you take the traffic that passed through the City-road on Saturday, June the 21st, 1856?—I did.

1014. From what hour to what hour?—From 12 on Friday night until 12 on Saturday night.

1015. What was the amount of the traffic?—Omnibuses, 800; cabs, 1,265; two-horse carriages, 78; one-horse carriages, 290; one-horse carts and vans, 830; two-horse waggons, 68; three-horse waggons, 23; four-horse waggons, 8; saddle horses, 80; gross amount, 3,442.

1016. By whom were you employed?—By Mr. Bradfield.

1017. Mr. *Alcock.*] Who is he?—The answer has been given by the previous witness.

1018. Is he the agent for the Toll Reform Society?—I cannot answer that.

1019. Mr. *James MacGregor.*] Whom did you employ to take that traffic; how many persons?—I did it myself.

1020. Were you on duty taking that traffic for 24 hours?—Yes.

1021. Uninterruptedly?—Uninterruptedly; there is a house just in front of the road where I could sit, the Fountain Tavern; there is a bench in front; I could sit there and take my meals, and watch the traffic.

1022. Have you a receipt for keeping awake for 24 hours?—I have done it for 36 hours.

Mr. *John Barber*, called in; and Examined.

Mr. *J. Barber.*

1023. *Chairman.*] WHAT are you?—A jobmaster.

1024. Do you live at Stoke Newington?—I live in the parish of Hackney, which is part of it.

1025. Do you know the lines of omnibuses in that neighbourhood?—Yes.

1026. Do you know of any difference that has been made there in the charge by omnibuses going through the turnpike, and those that do not go through the turnpike?—Yes.

1027. Which are they?—They are not on my road, they are on the Newington; one goes through the gate and charges 6 *d.*, and one does not go through the gate and charges 4 *d*, and one part of the road between London and Kingsland is only 3 *d.*

1028. There being no turnpike?—On the Newington, which I speak of, both go to one point; one goes from London direct down the road and through the gate, at 6 *d.*; the other line, without the gate, is 4 *d.*

1029. Mr. *Hildyard.*] How many passengers do the omnibuses that do not pass through the gate carry?—It is a newly-established line; it carries a great many people; I do not know the number.

1030. Are we to understand that you are representing to the Committee that you believe it is owing to not passing through the gate that it charges 2 *d.* less?—Decidedly.

1031. How many passengers does it carry?—I cannot tell you that.

1032. What do the omnibuses generally carry?—I do not know exactly how many they carry.

1033. Is it an ordinary omnibus carrying 12 inside?—Yes.

1034. Then 2 *d.* per passenger would make 2 *s.* upon the inside passengers alone?—Yes.

1035. And the same upon the outside; is there a reduction of 2 *d.* below the charge of the other omnibuses?—Yes.

1036. When was this established?—That has been established now about a month, I think.

1037. Are they opposition omnibuses?—No, they all belong to the same party; it is done for the accommodation of the neighbourhood.

1038. Mr. *Alcock.*] That is a reduction of one-third?—Yes.

1039. Do you mean that the taking away of the toll, or the alteration of the toll, has made one-third difference in the total expenses to the omnibus proprietors?—No, I do not think that; but it is a new neighbourhood that is established, and it is also a very desirable neighbourhood, and increasing greatly, and it is my opinion that the running of those omnibuses will draw the traffic off from where the turnpike is.

Mr. *J. Barber.*

24 June 1856.

1040. Suppose an omnibus cost 300 *l.* a year paying the toll, and the fare is 6 *d.*, and you reduce the fare to 4 *d.*, to put the two things upon the same footing, the expenses of the omnibus ought to be reduced to 200 *l.* a year; therefore the toll ought to be 100 *l.* a year to effect that; you do not mean to say that that is anything like the fact?—I have not gone into that; I am only speaking as to what is really the fact.

1041. Mr. *Hildyard.*] You have stated that the 2 *d.* lower fare was in your opinion referable entirely to its not passing through the gate?—I say they could not afford to run that distance and pay the toll; the toll on that road is 6 *d.* each way; they could not afford to run for 4 *d.*, and pay that.

1042. Colonel *Pennant.*] Then 2 *d.* per passenger is put on for the toll; the increased rate of 2 *d.* beyond the rate at which you take passengers up to that point is owing to the toll which you pay at the gate?—Yes.

1043. What is the toll an omnibus pays there?—Sixpence each way.

1044. How many times a day does it pay?—Fourteen times.

1045. Does it pay each time?—Each time it passes.

1046. Sir *John Shelley.*] Are those competing omnibuses?—They are not competing omnibuses; they are put on at the wish of the public, and they are able to carry, not going through the gate, at a less fare; and, in my opinion, they will take the principal part of the traffic away from the district beyond.

1047. What do you mean by not competing?—Both lines belong to the same proprietor.

1048. Sir *Benjamin Hall.*] On that line, where there is no toll, the charge is 4 *d.*?—Yes.

1049. On the line where there is a toll the charge is 6 *d.*?—Yes.

1050. Why is it that the charge is 6 *d.* upon that line, when the charge upon other lines of equal distance in the metropolis is only 4 *d.*?—I do not know that exactly; there are three different fares; one on the side of the gate where there is no toll being 3 *d.*, about a mile beyond that is 4 *d.*, and the whole distance is 6 *d.*

1051. What is the whole distance?—About 3 ½ miles.

1052. Whereabouts does that gate come?—At Kingsland.

1053. Then the 3 *d.* fare is short of the gate?—Yes, the 4 *d.* fare is about a mile beyond that, and the 6 *d.* goes the whole distance.

1054. Then the gate does not make a difference of 2 *d.*, but it makes a difference of 1 *d.*?—It makes a difference of 1 *d.*

1055. On the one side of the gate, supposing a passenger stops at the gate, he is charged 3 *d.*?—Yes.

1056. On the other side he is charged 4 *d.*?—Yes.

1057. And for going the whole length, he is charged 6 *d.*?—Yes.

1058. Including the gate?—Yes.

1059. What is the length of that part which is charged 4 *d.* where the gate is paid?—About 2 ¾ miles; that is the 4 *d.* fare; the 6 *d.* fare is 3 ½ miles.

1060. What is the distance of the new portion?—Three miles.

1061. Then it is just the same, or it appears to be very nearly the same, whether there is a toll or whether there is not a toll?—They would not be able to run there at that fare if there was a toll upon that line.

1062. Is not this the fact: that whereas upon the line upon which 6 *d.* is charged for the whole run, and upon which 4 *d.* is charged for a distance including the gate, there is a gate to pay?—Yes.

1063. And upon the other line, where there is no gate, there is equally 4 *d.* charged?—Yes, but that is rather a further distance; the one without the gate is the furthest distance for the 4 *d.* fare.

1064. But still there is only a difference of half a mile or less in the one as compared with other?—Yes.

1065. Then, in point of fact, the charge for passenger traffic is nearly the same, whether there is a toll or whether there is not a toll?—It does appear so by that; but the greater portion of the traffic is at the 3 *d.* distance. I should think where there is one person who rides for 4 *d.* there are five who ride at 3 *d.*

1066. Although that is the case with reference to the 3 *d.* distance, still as regards the 4 *d.* distance there is a toll?—Yes.

1067. And still the charge upon the other district where there is no toll is precisely the same?—Yes, but it has had this effect; the toll-bar was formerly

at

Mr. *J. Barber.*

24 June 1856.

at Shoreditch church; at that time there was no town of Kingsland; the gate has been removed to Kingsland, and a large amount of building has taken place there; but there is an immense number of persons there who could not ride if they had to pay the toll.

1068. But where the toll exists, or where the toll does not exist, the charges are the same?—Yes.

1069. Sir *John Shelley.*] In fact, generally, with regard to omnibus charges, the charge is made more as to distance than otherwise?—No, it has to do with toll.

1070. Mr. Alderman *Challis.*] You would, as a matter of commercial speculation, make those people pay 8 *d.* if you could?—I should think we should.

1071. Mr. *Alcock.*] You say the omnibus goes through this gate 14 times a day?—Yes.

1072. When you talk of the omnibus, what do you mean?—One omnibus.

1073. With how many pairs of horses?—Four pairs of horses.

1074. Then it is four omnibuses?—If there was only one pair of horses and one omnibus, it would pay just the same; if it went through 50 times a day, it would pay just so many times.

1075. Mr. *Hildyard.*] With respect to the new omnibus, have the inhabitants, for the purpose of the accommodation being put on, subscribed anything towards putting it on?—I believe they have; I am not aware to what extent; I believe it is only for a time. It is a neglected neighbourhood.

Jovis, 26° die Junii, 1856.

MEMBERS PRESENT.

Lord Robert Grosvenor.	Mr. Hildyard.
Mr. Wrightson.	Mr. Alderman Challis.
Mr. James MacGregor.	Sir William Jolliffe.
Mr. Butler.	Mr. Hastings Russell.
Mr. Wyvill.	Sir John Shelley.
Mr. Bonham Carter.	Colonel Pennant.
Mr. Alcock.	Sir Benjamin Hall.

LORD ROBERT GROSVENOR, IN THE CHAIR.

Mr. *Joseph Pattisson,* called in; and further Examined.

Mr. *J. Pattisson.*

26 June 1856.

1076. *Chairman.*] A QUESTION or two was asked you by some Member of the Committee, which you were not able to answer on the last occasion the Committee met; perhaps you can furnish the Committee now with the information they then desired. In the first place, you led the Committee to suppose that the highway rate, although you could not state exactly, was about 6 *d.* in the pound; that, upon a rental of 200,000 *l.* a year would not amount to so large a sum as 6,800 *l.*, which you stated was the rate necessary for the repair of the highways. Can you give any information to the Committee upon that subject?—I think I was under a mistake; that included Hans Town. The calculation I gave was based upon the exclusion of Hans Town. I do not know what the expenses had been upon the Hans Town district; only upon the district under the Improvement Commission.

1077. You state that then as exclusive, or inclusive, of Hans Town?—Exclusive of Hans Town.

1078. What do you mean by Hans Town?—It is a district formed by Act of Parliament about 50 years ago.

1079. And has a separate collection?—Separate.

1080. And it keeps the expense for the highways separate?—Yes.

1081. Is that Hans Town included in the rental of 200,000 *l.* a year?—It is at the present time.

Mr. J. Pattisson.

26 June 1856.

1082. Can you inform the Committee what the highway rate in that part of Chelsea is, which is under the Improvement Act?—There was a calculation made in 1845 for the eight previous years; this was for the information of the Board. Up to 1845 the lighting was all included; I believe they did not separate it; the lighting, the paving, &c., was 1 *s.* 3½ *d.* in the pound. When the Improvement Act passed, the improvement rate was 1 *s.* 6 *d.* in the pound, therefore there was an increase of 2½ *d.*; but under the powers of the Act of Parliament the Improvement Commissioners borrowed 30,000 *l.*, and they were compelled according to the terms of their Act to pay off 1,000 *l.* a year, after the expiration of the first five years from the passing of the Act.

1083. How did that affect the rating for lighting and paving?—Last October there was an 8 *d.* rate made; but through the recent Act which has been passed, of course the rates have increased. But the next rate which would have been made by the Improvement Commissioners would have been reduced 2 *d.* in the pound; that is to say, the 1 *s.* 6 *d.* rate would have been reduced to 1 *s.* 4 *d.*, because we collected one half-year 10 *d.* and the other half-year 8 *d.* in the pound.

1084. When you say "would have been," when would it have been; what year are you speaking of when there was a certain definite sum, and afterwards of what year are you speaking when you say it would have been?—This last April it would have been reduced; it was the intention of the Commissioners to have reduced the 10 *d.* rate to an 8 *d.* rate.

1085. Have they done so?—No; the recent Act of Parliament, which came into operation on the 1st of January, has increased the rate.

1086. By the recent Act, you mean the Metropolitan Local Management Act?—I do.

1087. Then you say that Act having increased the rate, you are unable to make a reduction; can you now tell the Committee what is the present rate for paving and lighting that part of Chelsea which is under your management?—It is 10 *d.* in the pound, according to the notice of the rate.

1088. Per annum?—It does not state here whether it is per annum; it cannot be per annum; there is an increase from the 1 *s.* 6 *d.* of 2 *d.*; it comes to 2 *s.* 2 *d.* per annum. The sewer is 2 *d.*, and the general purposes is 10 *d.*, that is in the Improvement Commissioners' district; but in the Hans Town district, the general purposes rate is 9 *d.* in the pound, and the sewers rate 2 *d.* That difference is caused because in the Improvement Commissioners' district they have got to raise the money necessary to pay off the 30,000 *l.*

1089. Mr. *Hildyard.*] Is that 9 *d.* in the pound in the Hans Town district a half-yearly or a yearly rate?—It is a half-yearly rate.

1090. It is an increase of 50 per cent. upon the last rate, of course, as you say, owing to the Act of Parliament?—It is.

1091. It is an increase of 50 per cent.; it was 6 *d.*, it is now 9 *d.*?—I do not exactly know what it was.

1092. Why did you say of course the Act of Parliament last year raised the rate?—That has been the effect.

1093. But why of course; does the Act of Parliament raise the rates in this matter; what has been the cause of that rise which you say is owing to the Act of Parliament; can you describe it?—We have got the sewer rate to pay for.

1094. But the sewage is not included in the sum you have mentioned in Hans Town; the sewer is quite distinct from the other; the 9 *d.* is for paving, lighting, watering, and cleansing; the sewerage is a separate rate; can you explain why there has been that increase of 50 per cent. owing to the Act of Parliament?—That I am not aware of.

1095. Sir *William Jolliffe.*] I asked you what the last highway rate, collected as highway rate by the Improvement Act, was?—It is 1 *s.* 3½ *d.*; it was the general rate for lighting and paving.

1096. In what year was that?—In 1845.

1097. In 1845, the general rate for lighting was 1 *s.* 3½ *d.*?—Yes.

1098. What was it in 1855?—One shilling and sixpence.

1099. It is an increase of 2 *d.* under that head, is it?—An increase of 2½ *d.*

1100. *Chairman.*] That is what you call for general purposes, is it?—That was under the late Act.

1101. For what purposes?—For all purposes.

1102. Mr.

1102. Mr. *Butler.*] Since the year 1845 you have performed large paving works in the parish, have you not?—Yes.

1103. Have you considerably more paving now than you had in 1845?—Yes.

1104. Consequently you have a larger rate for the maintenance, is that so?—The mileage has increased in the parish since the year 1845.

1105. Then if the mileage has increased, I presume the cost of maintaining it has increased also?—Precisely.

1106. Mr. *Hildyard.*] But this increase you have spoken of, of 50 per cent., is since the Act of last year; not the Chelsea Improvement Act?—It is.

1107. Has there been any increase since the Act of last year came into operation in the amount of paving, thereby imposing an additional expense?—Very little; nothing of any importance.

1108. Mr. Alderman *Challis.*] Then how do you account for the increase of expense?—I do not know how the vestry have made it out at all; they entered into their own calculation.

1109. Sir *William Jolliffe.*] Are the roads and streets in Chelsea better maintained in 1856 than they were in 1855?—They are.

1110. Since last year?—Yes; there has been a very trifling amount done; there has been an increase since that period, but of no great amount.

1111. But are the streets and roads in a better state now than they were last year, since this additional rate has been levied?—The streets have been better attended to than they hitherto had been since last year.

1112. You are the surveyor, are you not?—I am, of the whole district.

1113. You receive the orders of the Local Board of Management, do not you?—Yes.

1114. Cannot you inform the Committee whether you have, in consequence of those orders, paid greater attention, and ordered more expensive and extensive work since the passing of the Act last year?—We have laid out a great deal of money upon the roads during the last four or five months.

1115. More than usual?—I think I may say more than usual since the 1st of January.

1116. The fact is, you have had more money to expend, have you not?—We had the increased rate to work upon.

1117. Mr. Alderman *Challis.*] Have you laid out one-half more money in consequence of getting one-half more rate?—No, I cannot say that we have.

1118. *Chairman.*] This increase of rate of 50 per cent. is in one particular district; it is not a general increase of rate over the whole parish, is it?—The increase is in the bad districts; I think so. I do not see why the increase should be in one district.

1119. Mr. *James MacGregor.*] There are 23 miles of road under your charge in Chelsea?—All the parish of Chelsea; Hans Town is in Chelsea.

1120. Do you adhere to your statement that 300 *l.* a mile per annum is the sum laid out for their maintenance?—It appears to be the case according to what I can see at the present time, because the vestry have set out the sum of 6,800 *l.* for the maintenance of these roads.

1121. Can you explain the discrepancy between 6 *d.* in the pound upon the assessment and 6,800 *l.*?—Whether that difference arises from the separation of the two districts I do not know; the 6 *d.* in the pound only ran over what we calculated upon for the Improvement Commissioners' district; it excepted Hans Town.

1122. How many miles are there in Hans Town?—About four miles; the assessment of Hans Town is 48,000 *l.*

1123. Mr. Alderman *Challis.*] Has there not been some extra work on account of breaking up the roads for the purpose of making sewers?—There has.

1124. Mr. *Hildyard.*] We are only speaking of the increased expense which is to be set off against the increase of 50 per cent. in your rate; specify those expenses, will you?—There was a sewer constructed in the King's-road.

1125. Would not the expense of that belong to the sewer-rate?—It was constructed at the expense of the late Commissioners of Sewers; but it was completed this year; we have done no sewerage works of our own.

1126. We are not speaking of the expense of sewers; we are speaking of the expense upon the highway rate from the breaking up of the road for the sewers, because the sewer-rate is a district rate?—Yes.

Mr. *J. Pattisson.*

26 June 1856.

1127. What portion of roads in the district have been broken up this year in consequence of the construction of sewers?—There was part of the King's-road.

1128. How much of the King's-road?—I can hardly tell the length.

1129. As near as you can?—I can hardly tell the number of yards, because the works were going on from the latter end of last year.

1130. I do not want to bind you to a yard or two; but let us know what we are speaking about?—I should think there must have been about 500 yards of sewer in length.

1131. This year broken up in Chelsea?—I think so; somewhere thereabouts.

1132. Have you any other instance to state?—No. I am now taking the whole length, about 500 yards altogether; I should think so.

1133. That is the only reason that you can assign for the increase of 50 per cent. in the rate?—That is all I have to assign; I know of no other reason why it should have been increased. There might have been some reason, but of course I cannot state it. When they made the rate, they made it upon certain data, which I do not know; I was not present at the time.

1134. Mr. Alderman *Challis.*] Do not you know that they charge the sewer's rate, though a separate rate, with the breaking up of the roads for the sewers; do not they charge themselves with the whole expense of making those roads good again?—It would be so, because whatever the charge for repairing the road is, it would go against the sewer rate.

1135. Sir *William Jolliffe.*] When are your accounts audited?—Our accounts were audited up to the 25th of March in every year; that is the Improvement Commissioners' accounts; but of course they have not been audited this year.

1136. Why of course?—I suppose in consequence of the coming into operation of the Metropolis Local Management Act.

1137. So that there has been no audit of the account?—No, not of that particular account, the Improvement Commissioners' account; it has been handed over to the vestry.

1138. Have you taken in your own account as surveyor up to the 25th of March?—No, I have not any account at all. The clerk makes up all those accounts, and he takes in the account for the twelve months.

1139. Do you not pay the persons employed by yourself for the repair of the roads?—That return is made every fortnight to the vestry.

1140. That is your duty?—Yes.

1141. Are you now expending in 1856 more per fortnight than you were in 1855?—Yes, we are.

1142. On what account?—On account of the additional expense upon the sewers. Then we have had additional men for cleansing the roads, and the consequence of that is, it increases the cartage.

1143. From whom do you receive directions for this additional expenditure?—I receive my orders through the vestry.

1144. And receiving those orders from the vestry, your expenses are increased?—They have been increased.

1145. Mr. Alderman *Challis.*] Are the orders of a more expensive kind; are they 50 per cent. higher, or more than they were before?—I say that we have done very little additional work within this last six months.

1146. Mr. *James MacGregor.*] As to these 23 miles of road, have you ever divided it into districts, so as to class the roads?—Never.

1147. Have you ever kept any account of the expense of maintaining the roads, over which there is much traffic, as distinguished from those over which there is little traffic?—No.

1148. Are the roads all watered there?—They are.

1149. Is that included in the 6 *d.* in the pound?—Yes.

1150. When did the watering begin?—The watering commenced in 1845.

1151. With regard to opening the roads for the sewers, is not the cost of that repaid to you?—It is.

1152. Have you kept an account with regard to the 500 yards?—Yes; I kept an account, and rendered it to the vestry.

Henry Browse, Esq., called in; and further Examined.

H. Browse, Esq.

26 June 1856.

1153. *Chairman.*] I THINK you told the Committee you could give them the income arising from the tolls in each of the three decennial periods since the Commission was established?—Yes, I think I can.

1154. Will you have the goodness to state what it is?—The first average is for the five years commencing in 1831 to 1835. You will see that, previous to that some of the roads were given up.

1155. I want the total income from tolls in each decennial period?—That is 1835, 1845, and 1855.

1156. Have you 1836, 1846, and 1856?—We have only got it for 1835 at present.

1157. 1835 will not give 10 years?—It will give an average over certain roads, but previous to that certain roads were given up.

1158. I want the income for the three decennial periods?—£. 78,138 in 1835.

1159. Is that from 1825 to 1835?—No, we cannot take it from 1825, inasmuch as roads belonged to the Commissioners in 1826, which did not belong to the Commissioners in 1835. The average receipt of tolls for the five years ending 1835, was 78,138 *l.* per annum. The average for the 10 years ending 1845, was 72,380 *l.*, and the average for the 10 years ending 1855 was 64,695 *l.*

Mr. *Arthur Ashpitel*, called in; and Examined.

Mr. *A. Ashpitel.*

1160. Mr. *Butler.*] HAVE you considerable property in the Lee Bridge-road?—Yes.

1161. In the parish of Hackney?—Yes.

1162. You live there, and have also a large dock and wharf property, I believe?—Yes.

1163. Those docks and wharves were constructed many years since?—Some 30 years ago.

1164. Do the trustees of the Lee Bridge-road claim the right to tolls?—They do.

1165. Have they posts and chains put there?—They have.

1166. Are they also trustees of the metropolitan roads in that district?—I do not know; I think not. The bridge is an iron bridge; it was built some years ago at a considerable expense. They call this a bridge toll. I do not know whether it is under the control of the Metropolitan Commissioners or not. I hear the surveyor say that it is.

1167. Your property, I believe, is between Clapton gate and the Lee Bridge gate?—Yes.

1168. Do your tenants pay both tolls?—My tenants pay both tolls, although they do not go over the bridge.

1169. Then they do not derive the slightest benefit from the bridge?—Not the slightest.

1170. But they actually pay both tolls?—They pay both tolls.

1171. Does this toll act as a prohibition to building wharves in the neighbourhood?—Yes, it is an absolute prohibition. I have about 400 feet of off line of frontage there which I cannot let at all; I had an offer the other day for it. A man offered me 48 *l.* a year, and when he found that they were authorised to take two tolls, he threw it up altogether, and would have nothing to do with it.

1172. About what is the value of your property?—There is as much unlet as ought to let for 150 *l.*

1173. Have you also land unlet?—Yes.

1174. Do you consider that is in consequence of the heavy tolls you have to pay?—I do, decidedly.

1175. In fact, it operates as a prohibition; you cannot get tenants to occupy your property?—It is so.

1176. What does the toll amount to there; 6 *d.* a ton?—It is 3 *d.* at each gate for a single horse-load, which is about a ton; so that that makes 6 *d.* a ton for the two gates.

1177. What per-centage is that upon the articles?—I suppose the charge for wharfing would be from 9 *d.* a ton.

1178. So that it is more than 50 per cent. on the wharfage?—It is more than

Mr. *A. Ashpitel.*

26 June 1856.

than 50 per cent. upon the wharfage. It operates as an absolute prohibition to the letting of the property.

1179. Have you property also within the borough of the Tower Hamlets?—Yes, considerable property.

1180. Is that property there very much prejudiced by the tolls which are levied?—Yes. I consider that property near a toll-gate in all cases is considerably prejudiced.

1181. Have you any other subject which you wish to mention to the Committee?—There are so many gates there, that sometimes in driving five miles I have been obliged to pay four gates. When I have been down upon this property, my head clerk lives in Islington, and I am obliged to call upon him very often of a morning, and I have to pay the Lea Bridge gate, and the Clapton gate, and the Ball's Pond gate, and then I have to pay either the City-road gate or the New North-road to get into London; so that upon five miles' driving, I pay four tolls very frequently.

1182. Mr. *Alcock.*] In what parish do you say this property is?—In Hackney parish.

1183. Has the question been mooted in your parish of getting the tolls removed, and putting the expense of the repair of the roads upon the parish?—I believe it has.

1184. Do you know what the opinion is upon that subject?—I believe the opinion of all those who keep horses would be, that they would be very glad indeed to get rid of it, and a great many who do not keep horses; but others, perhaps naturally enough, consider that it would increase their highway rate if the roads were thrown upon the parish.

1185. Mr. Alderman *Challis.*] What is the proportion of the number who keep horses compared with those who do not; we may assume that those who keep horses would be glad to get rid of the toll, and we may assume, on the other hand, that those who do not keep horses would be very glad to retain the toll, and that those who do keep horses should pay for the gates?—There is a very large class of omnibus riders and omnibus proprietors who consider that the toll is a very heavy charge upon them.

1186. You do not, and individuals there do not expect, if the tolls were removed, to ride for less than 2 *d.* or 3 *d.*?—They charge 4 *d.*; and I have consulted several of them, and they say if there were no tolls and no duty, they could go for 3 *d.*

1187. Sir *John Shelley.*] What, in your opinion, would be the general effect upon the property in the parish if the tolls were taken off and the repair of the roads thrown upon the parish?—I think it would be very beneficial indeed to the property in the parish.

1188. How much would it increase the value of the property in the parish, in your opinion, if you took off all the tolls in the parish and threw upon the parish rate the burden of keeping up the roads; how much per cent. do you suppose it would increase the value of the entire of the parochial property?—I cannot answer that question at all.

1189. Fifty per cent., or 20 per cent., or 10 per cent?—I cannot say.

1190. You have stated that you have been offered something less than 50 *l.* for property which you considered was worth 150 *l.* a year?—No; 48 *l.* was offered, that was for a portion; but the party who offered me 48 *l.* for a portion found that he should have two tolls to pay, and he would not take it at all; he threw up the whole transaction.

1191. Mr. Alderman *Challis.*] If you cannot estimate how much your property would be improved by the taking off of the tolls, can you calculate how much the whole of the house property would be depreciated by keeping them on?—It is impossible to say in a parish which is 11 miles in circumference; it would require a very vast calculation indeed to go into a matter like that.

1192. Mr. *Butler.*] You are a surveyor?—I am.

1193. And are largely engaged in the valuation of property?—Yes.

1194. Particularly in the valuation of house property?—Yes.

1195. Therefore you must be necessarily conversant with the value of property generally, and you say that you are decidedly of opinion that a toll-gate operates very prejudicially upon the value of property?—I am sure of it.

1196. Sir *Benjamin Hall.*] What is the name of the parish in which your property is situate?—Hackney.

1197. Is

1197. Is this Lee Bridge gate situate near the centre of the parish, or on the confines of the parish?—The toll-gate which I speak of is pretty near the east end of the parish.

1198. When you say that by the removal of the gate the property in the parish would be materially benefited, do you mean to say that the whole of the property in the parish would be benefited, or that merely the property in the immediate neighbourhood of the gate would be benefited?—The property in the neighbourhood of the gate; but I think it would also operate upon the whole entire property of the parish to be without those nuisances, the toll-bars; I think they are a damper wherever they exist, and I think if they were removed the whole parish would feel the benefit.

1199. What is the distance of the toll-gate from the extreme end of the parish?—The toll-gate of which I speak is at the extreme end of the parish; I suppose the parish is perhaps three miles in length and two in width; it is at the extreme east end this individual gate.

1200. How, then, would the property at the west end of the parish be benefited at all by the removal of that gate?—I do not suppose that the property at the west end would be much benefited by anything done so far off as at the east end; but I speak generally of the effect of toll-bars.

1201. I understood you to say that if that toll-gate were taken down, and the expense of the repairs of the road thrown upon the parish, it would be a great benefit to the parish; did I understand you correctly?—I mean the gates generally.

1202. If all the gates were taken down, you mean that that would be a great benefit to the parish?—I think it would.

1203. How would it benefit the ratepayers to have an extra rate put upon them for the improvement and repair of the parish roads?—It would operate as a benefit to them in the way I say, by removing what is, in my opinion, a damper to traffic, and an inconvenience and a nuisance to the place.

1204. But would it not be a great damper to the ratepayers to have 2 *d.* in the pound additional rates?—I think not; the roads must be paid for by somebody.

1205. Sir *William Jolliffe.*] Is there any large portion of property within the parish which is so materially injured by the existence of the gate as your own property is?—I think not. This property of mine stands by itself; it is the only portion that is built upon; I do not know a parallel case to that anywhere, in which property has to pay for a bridge where the tenants never go over the bridge at all.

1206. Having this isolated inconvenience as regards your own property, have you ever petitioned the Commissioners in respect of that case?—I believe my father did so; but I have not done so myself.

1207. How long has the property been in your possession?—My father died about four years ago; I have had it since then.

1208. You have not represented your case to the Commissioners?—No; I went abroad at the period at which the property came to me; I resided in Italy for some time; I have not long been back, and I have not had an opportunity of doing so. This is the first time I have had an opportunity; I only saw in the newspaper this morning that the Committee was sitting, and I determined to come here, and ask them if they would take it into their consideration.

1209. You thought it a peculiarly good opportunity of stating your case?—I did.

1210. Then, whatever effect the removal of the turnpike gates entirely might have upon the property throughout the parish, it would have a very beneficial effect upon your own property?—A very beneficial effect.

1211. Mr. *Butler.*] You have been asked whether this gate was at the extreme east end of the parish?—It is.

1212. There is another gate at the extreme west end, I believe?—There is.

1213. Are there other gates intermediate between the extreme east and west ends?—Yes, in the north.

1214. So that the property is affected all over the parish by the gates?—Yes.

1215. Sir *John Shelley.*] I understood you to say that the owners of horses were opposed to the existence of this gate, and would be glad to have it removed?—Yes.

Mr. A. Ashpitel. 26 June 1856.

1216. And that some of the persons who do not keep horses would be also ready to pay an increased rate, if the whole of the gates were removed?—Yes, I have heard many express that opinion.

1217. And I understand you that it is because you think if the toll-gate was taken away, they would have the advantage of going in omnibuses with a reduction of fares?—Yes.

1218. Are you aware that last year Parliament took off a certain portion of taxation upon public conveyances?—No, I was not in the country then.

1219. Has any reduction of omnibus fares taken place upon the line since last year?—Not since last year, I think; I do not know, but I think not.

1220. Then the reduction which was made last year by Parliament in the taxation on omnibuses has had no effect in reducing the fares?—I think not.

1221. Then what makes you believe that if the tolls were taken off the omnibuses would be likely to reduce their fares?—I have heard several of the proprietors say so; I know one who said so; I think it was Mr. Barber.

1222. The ground upon which you believe that the ratepayers, who are not owners of horses and carriages, would be ready to have an increased tax put upon them in the shape of rates for the repair of roads, is upon the idea that the omnibus proprietors would lower their charges, provided the tolls were done away with?—Partly so; and because some people think it an antiquated way of levying a tax, which it would be well to do away with.

1223. *Chairman.*] Where is the gate of which you speak, where your property is; point it out on the map?—It is just out of the map.

Mr. *John Edwin Bradfield,* called in; and Examined.

Mr. J. E. Bradfield.

1224. Sir *Benjamin Hall.*] I HAVE received a letter from you, in which you intimate your desire to give some information to this Committee, and you date that letter from the Central Office for the Modification of the Metropolitan Tolls. Are you the secretary to that association?—I am.

1225. Of whom is that association composed?—Partly of omnibus proprietors, and partly of individuals, independent gentlemen, from whom a petition has been presented through me to the House of Commons; I believe there are about 500 gentlemen in all.

1226. What is the nature of the association?—The object of the association is primarily to get rid of the advanced toll-gates within a certain radius of London.

1227. Is it not to get rid of the tolls altogether?—It is.

1228. Are the affairs of that association managed by a committee?—It has more been left to my own agency than anything else; we have had two or three meetings upon the subject.

1229. Have you got any minutes of the proceedings?—I have not. I mean I have not got them here.

1230. Have you no minute book of the proceedings of that association?—No.

1231. Not any?—Not any.

1232. When did the association meet last?—I think the last meeting we had upon the subject, was when we went up to Lord Lonsdale; thirty gentlemen met at that time.

1233. Three weeks ago?—More than that.

1234. Has there not been any meeting of the members of the association?—That was a meeting.

1235. Has there not been any meeting of the members of the association between the time when you went as a deputation to Lord Lonsdale and the present time?—No, only those gentlemen who were primarily managing the affair, not of the general body.

1236. When did they meet last?—The last time I saw them, though I cannot call it a meeting, was one day last week.

1237. Who were present at that meeting?—There was Mr. Slater of Kensington, Mr. Johnson; I think there was Mr. Bamford of Kensington; I cannot tax my memory; Mr. Hartley and others.

1238. How many were present at the meeting?—I do not know whether I could call it a meeting. You are asking me, with great submission, to answer questions

questions for which I am, with great deference and respect, not prepared; you called upon me to come here and make a statement with reference to the Commissioners.

1239. You have stated already in answer to a question, I have put to you, that you are secretary to the Association for the Modification of the Metropolitan Tolls; I want to know of whom that association consists; I want to know whether you keep any minutes whatever of your meetings, and I want to know who form the committee of that association, if there is such an association, and how the business of the association is conducted, and I presume that you, as secretary to that association, can give me that information?—The association, as I said before, is composed of certain omnibus proprietors and others, independent gentlemen whom I have named; I appear here to-day as the agent of the omnibus companies referred to.

1240. Then I am to understand, now, that you are secretary to an association for the modification of the metropolitan tolls, but that you desire to appear here on behalf of omnibus proprietors?—That is it.

1241. Now I wish for information upon two points: first of all, with regard to the association for the modification of tolls, and next, presently, I will come to the position which the omnibus proprietors desire to take by your appearance here to-day; therefore I will confine my questions, in the first instance, to the Association for the Modification of the Metropolitan Tolls, of which I understand you to say you are the secretary; how many members are there in that association?—I cannot answer at the present time; I have come totally unprepared for that; my object is with reference to the omnibus proprietors alone.

1242. But as you are secretary to the association I want to know the names of the members of whom the association consists generally; what I want is more information as to the nature of that association; is that association supported by subscription?—It is to a certain extent.

1243. Is it supported also by donations?—By subscription.

1244. Have you got a list of the subscribers?—I can supply it; I have not any papers or any documents at the present moment. I almost think, with great respect, that you are rather premature in asking me the nature of that association, when I do not come prepared to answer any questions with respect to it.

1245. It is a matter of perfect indifference to me whether you come prepared to give evidence upon that point or not; but you have told the Committee, since you have been put into the witness-box, that you are secretary to an association for effecting a certain object in immediate connexion with the object for which this Committee was instituted?—That is right.

1246. Therefore what I want is to have information as to the nature of that association, and the proceedings of that association. As you say that this association is supported by subscription, what was the amount of subscription received last year?—It was not in existence last year, and that is the reason why it is hardly in a state of actual complete formation at the present time; it is a matter that has been running on.

1247. If this association was not in existence last year, and has only been in existence during the current year, surely you will be able to tell the Committee how much has been received for the current year as subscription for the maintenance of the association?—I cannot tell you that; there have been certain subscriptions paid in, but some may have been paid to other parties, of which I may have no knowledge. I have confined myself more immediately to an investigation into the tolls, a matter which has been going on many years. I have had my time very much occupied in looking after that.

1248. How are the expenses of that inquiry, and the expenses of the proceedings that have been taken in reference to tolls defrayed?—I have partly defrayed them myself, so far as I am concerned.

1249. How have the rest been defrayed?—I do not know whether there have been any beyond what I have defrayed myself.

1250. Then you have paid the whole?—Yes.

1251. Then are the Committee to understand that you have done this out of your own private resources, or out of funds which have been provided

Mr. *J. E. Bradfield.*

26 June 1856.

by other parties?—The association, if you call it an association, is certainly indebted to me to a considerable amount at the present time.

1252. That is no answer to the question; are the Committee to understand that you have done this out of your own private resources, or out of the funds which have been provided by other parties?—I have paid it out of my own private resources up to a certain amount.

1253. From what other sources does the remainder come?—I do not know; I believe there are none; I believe I am the only party who has paid.

1254. Then no other party has paid anything?—I make that answer because there are other gentlemen who have been engaged in the removal of tolls for some years. What they have done I do not know; I am only speaking for myself.

1255. Are the Committee to understand that the expenses which the association has been put to in relation to the abolition of tolls are to be defrayed wholly and entirely by yourself?—No, certainly not to be defrayed wholly and entirely by myself; so far as they have gone I have defrayed them.

1256. By whom will they be defrayed; by whom will your expenses be paid?—I apprehend by several of those gentlemen who have been moving in this matter.

1257. By omnibus proprietors?—Certainly, and by other parties.

1258. Sir *William Jolliffe.*] When was this association formed?—About the beginning of this year.

1259. At a meeting, at some advertised meeting, or in what way was it formed?—This question originally arose last year out of the reduction of the public carriage duty, though there was no formal arrangement made for it; and in communications which I had with the late Mr. Hume, who advised me as soon as I had done with the question of the duty off public carriages, to take the abominable toll system in hand. I have his letter, written a very few days before his death; he advised me to take the tolls up.

1260. So that this association existed before it became an association for the reduction of tolls?—Certainly not.

1261. Then when did it come into existence?—The beginning of this year.

1262. You say it arose out of an association which was for the reduction of the public carriage duty?—The consideration of it, so far as the owners of public carriages were concerned.

1263. The owners of public carriages then formed an association last year to agitate for a reduction of duty upon public carriages?—Just so; and it was out of that that this sprang.

1264. You succeeded in your object with regard to the reduction of the duty upon public carriages, and then turned your attention to the next matter which affected them, which was the reduction or extinction of the toll?—Just so.

1265. How does an individual constitute himself a member of this association?—I can hardly answer that, because I consider it established so recently that I have hardly had time to turn my attention to the formation of the association.

1266. *Chairman.*] Are there any rules and regulations?—No.

1267. Nor any committee?—Nor any committee.

1268. Sir *John Shelley.*] I understand you can furnish a list of the subscribers?—I can.

1269. There is a list?—There is.

1270. Do they take any part in the management as to the way in which the money which they have subscribed is expended?—Mr. Slater has taken a very active part, but he is not an omnibus proprietor; Messrs. Travers, of the city, are also subscribers.

1271. Does he look after the accounts?—No, I do not think there is much to look after upon that matter.

1272. In fact there is no direction at all?—Not at present. I represent and have managed it. The whole thing has been put into my hands more as a matter of business than as a matter of association or raising subscriptions.

1273. Mr. *Alcock.*] Touching the question of mileage duty last year, you took it in hand and succeeded, and no doubt you were handsomely recompensed?—I was.

1274. And now the omnibus proprietors, seeing that you are a clever man, and manage

manage matters well, have engaged you upon this question, and no doubt, if you succeed, you will get recompensed as well as before?—No doubt at all; otherwise I should not have advanced the money I have. Messrs. Travers have subscribed money, I believe, and other things have gone on; but I have never looked much into that.

1275. Sir *William Jolliffe.*] What is Mr. Slater's interest in it?—He is a butcher.

1276. I suppose he possesses a great number of carts which pass through those gates?—He does.

1277. And therefore in a pecuniary point of view Mr. Slater's interest is very much affected; he lives at Kensington?—In St. Margaret's, Westminster, in the district of Kensington. His case is this, that as an inhabitant of St. Margaret's, Westminster, he is rated for the repair of the roads, and he has got a tollgate close to his door; that is his case.

1278. Sir *Benjamin Hall.*] Having stated that you are secretary to the association for the modification of the metropolitan tolls, that you appear also upon behalf of the omnibus proprietors, and have managed the whole of the case which you desire to bring before the Committee in relation to the reduction of tolls, have you any statement which you desire to make to the Committee?—I have. I observe by the first Report of the Commissioners, published in 1827, that they then reported to Parliament that they had not been unmindful that one of the chief objects of consolidation of turnpike trusts was a reduction of the tolls; and in subsequent reports they all go forward to show, that the object of the establishment of this Commission was the reduction of tolls. I believe at the present time the debt is entirely extinguished for the purpose of paying off which that committee was raised; but being an inhabitant myself, I may speak, perhaps, in that character at the present moment, with regard to the ninth district. I wish particularly to draw the attention of the Committee to the state of the accounts of the ninth district, which is Highgate, Hampstead, and Islington. It appears, by Account 239, that this Commission has, during the last six years, received various sums of money, and expended on account of that district also various sums of money, including however three miles one furlong of the Seven Sisters road, and when those figures are added up it appears that a sum of between 16,000 *l.* and 17,000 *l.* has been overpaid by the ninth district. I wish particularly to direct the attention of the Committee to the position of the Commissioners, which that fact must show, because at the present moment, notwithstanding the late reduction of tolls last year, there are three gates, at Islington, at St. Pancras-road, and at the Hampstead-road, standing. I particularly wish that the ninth district should have your consideration also, because I am informed that the Commissioners, after the 1st of July, will have that district in their own hands. I should wish an inquiry to be made how this district is to be managed, who is to manage it, who is to check the toll account, and who is to check the repairs of the road, and especially the granite account of that district. I have had some opportunity of looking at that district, and I have certainly reason for urging the attention of the Committee to the expenditure upon that district. It was stated by Mr. Browse, upon his first examination, that if the three advanced gates which I have alluded to, the Islington, the St. Pancras, and the Hampstead-road, were removed, it would lose to the Commissioners 10,000 *l.* Now, I humbly submit, if it did lose the Commission 10,000 *l.*, the Commission owes a greater sum to the district; but he altered that statement, and he says now it is 5,000 *l.* Now if it is 5,000 *l.*, it shows a greater reason why those gates should be removed. However, there has been evidence supplied to the Committee which demonstrated that upon two of those gates, as to which the public carriages might represent, according to their own statement, one-half of the whole toll, only 4 *l.* a week is paid, so that the loss could not be to the extent stated by Mr. Browse.

1279. Do you wish to convey to the Committee that your impression is, that the toll which has been collected at these gates, has been expended in the following manner: First of all in the repair of the roads, next in the payment of the debt of the roads upon that particular district, and that after the debt has been paid upon that particular district, the tolls have not been reduced to such a sum as would merely cover the expense of the repairs of the roads, but that there has been a surplus, which surplus has been laid out in liquidating the debt upon the other trusts?—I presume that that must be the case, at all events it will

Mr. *J. E. Bradfield.*

26 June 1856.

appear upon the accounts that the Commission owes the district that sum of money.

1280. In what way does that appear?—It appears by the account No. 237, ordered by the House to be printed on the 23d of May of this year.

1281. Will you explain how that appears?—It appears by the figures; one is an account of the receipts from the tolls of the district, the other is an account of the mileage, and the expenditure upon the roads of the district; they are given separately. This is a return which I was the means of procuring for the purpose of ascertaining the receipts and expenditure of each district.

1282. Taking your view of the case, it appears by that return, that a certain sum of money has been collected by the gates within that ninth district?—Yes.

1283. And that after defraying the expenses of repairs within that district, there being no debt in that district, all the surplus has been expended in defraying the debt which has accrued in other districts, or for the repairs of other districts?—Just so; I presume that that is the case.

1284. And for the general purposes of the commission?—And for the general purposes; it would not be to the extent of 17,000 *l.*, inasmuch as the expenses of the commission have to be taken from it.

1285. But in respect of the proportion which that district would bear to the general expenses of the Commission, the whole of the surplus has been devoted to the payment of the debt or the repairs of the other roads?—It appears so.

1286. Sir *William Jolliffe.*] You ascertained this fact from the paper which is before you?—Yes.

1287. And which was presented to Parliament by the Commissioners themselves?—By the motion of General Wyndham, which I was the means of obtaining; not by the return of the Commissioners, but by a return to Parliament on the application of an independent Member; it is not a voluntary return, certainly not.

1288. Sir *Benjamin Hall.*] It is not a return pursuant to Act of Parliament, it is a return made in pursuance of an order of the House?—That is so.

1289. Sir *William Jolliffe.*] Have you found a surplus in favour of other districts in that return?—Slightly; generally speaking, it is very slight indeed; but this is a large amount.

1290. How much is it?—£. 17,000 in six years.

1291. Mr. *James M'Gregor.*] Have the Commissioners recently reduced the toll upon that district?—They have reduced it one-third, to the amount of a loss of 2,000 *l.* a year; having 17,000 *l.* in hand, the expenses are 13,000 *l.* Perhaps the Committee will allow me to explain myself; the receipts were 15,000 *l.* and the expenditure 13,000 *l.*, therefore there is no loss whatever by that reduction.

1292. Sir *Benjamin Hall.*] Have you any other points to which you desire to direct the attention of the Committee?—I wish to draw attention also to the Twenty-seventh Report of the Commissioners, in which they speak of the waterworks on account of the questions which one of the Members of the Committee put with reference to the water, because it appears by the Twenty-seventh Report, the Twenty-eighth Report, and the Twenty-ninth Report, that large sums of money are due to those Commissioners from the various water companies, and it appears that large sums of money have also been paid by those Commissioners for watering the roads. In 1853, they say that a large sum of money is due from the East London Waterworks.

1293. What report is that?—This is the Twenty-seventh Report, 1853. At page 6 it is stated that the East London Waterworks Company owe a large sum of money for wear and tear and disturbance by change of pipes; I have looked through the Parliamentary accounts, and I can find no account of the receipt of money from that company. In the Twenty-eighth Report, 1854, page 5, it is stated that the Grand Junction Waterworks Company have injured the road in Brentford town; I find no account carried to the credit of the Commissioners for any compensation for that. In the Twenty-ninth Report, 1855, at page 5, it is stated that large sums of money are due from the West Middlesex and Southwark Water Companies; and if you refer to the Thirtieth Report, at page 4, you will find this Commission actually paying money for water to the West Middlesex Waterworks Company, and there is no account and no reference made to the money that is owing to the Commissioners. Of course

course I can only speak from the Parliamentary returns. What is in the accounts of the Commission, I know not. There are some matters connected with the granite which I do submit require explanation, without wishing to cast anything upon the Commissioners by saying that they do not exercise any ordinary care or control over the Commission, but I do submit that if you take the last Reports and look to the quantity of flint, and gravel and granite, and the amount of day labour and team labour, and then refer to the answers which have been given during the examination, it is very unsatisfactory for a public Commission like this receiving money, not to be able to give a better account.

1294. *Chairman.*] You make your remark upon all those four items?—I make my remark as to the 11,000 *l.* for day labour, the 12,000 *l.* for team labour, the 28,000 *l.* for the materials, and the 2,000 *l.* for the watering.

1295. Where is that?—At page 4; and the very company that is stated in one report to be indebted is here on the other side of the account, where they are paying money to them. I should humbly submit that those parties whom I represent, taking the omnibus proprietors, who are the larger payers of these tolls, have at least a right to know how these granite accounts have been kept; what price has been paid in the several districts for granite, who have been the parties who have supplied the granite, who have measured the granite, who have carted it, and what check has been exercised over those accounts before the accounts were finally paid. I am referring back to the evidence of the accountant; there was evidence, certainly, of an audit, but as yet you have no evidence before you of any audit consistent, I should say, with the dignity of a Commission like this, and in connexion with the amount of money that is passing through its hands. I would beg, in support of that observation, to state this, because I believe it is a fact; I speak it under correction: I am informed that it has been the practice in this Commission for all its officers, those gentlemen who would keep those accounts, to accept offices in other trusts; I am not complaining of this; I am merely stating the fact. Now, it would be perfectly impossible, with the due exercise of their trust in this Commission, that they should occupy posts in other trusts; but if they can, it shows how very easy it would be for the parishes afterwards to take to those roads, because the large staff of officers being employed some 50, or 30, or 20 miles away in the management of other businesses, taking them away to that distance must necessarily show this, either that there was great negligence, or that the Commission was managed very easily. I should be very unwilling to assume anything, but I am instructed that this is a fact, and I beg to name it to the Committee.

1296. Sir *Benjamin Hall.*] Can you state any instances in which the officers of the Metropolitan Roads Commissioners are also officers of other trusts, under the control of the local authorities?—I believe the surveyor-general himself, Mr. Browse, is, of whom I speak with respect, and also Mr. Anderson. I merely name the fact; and I say there must have been a great deal of negligence necessarily, or it is a very easy thing to transact the business of those 120 miles of road, if the head surveyor and all those gentlemen could hold offices in trust which carried them many miles away from the metropolis.

1297. You have stated that the surveyor-general is employed by trusts other than the metropolitan trust; can you inform the Committee whether any of the other officers of the metropolis trusts are similarly employed?—I believe that Mr. Murray Anderson, from his own statement to me, is manager of the Commercial-road trust; he is also manager of the Junction trust, being also surveyor of this very ninth district.

1298. Those trusts you have now named being wholly unconnected with the Metropolis Road Commission?—Clearly so.

1299. Are there any other officers whom you can name similarly employed?—My information does not extend further.

1300. Sir *William Jolliffe.*] Are you aware who the general-surveyor of these roads was before Mr. Browse's time?—Sir James M'Adam, I believe.

1301. Have you any idea of how many trusts he was surveyor?—I have been told several, and that the practice originated in his time.

1302. Are you aware that he was the surveyor-general of roads extending to Holyhead?—Not so far as that. I believe he was surveyor of some very extensive roads. At the same time that that general information is given, I must say that Sir James M'Adam was employed originally by the Government, and

Mr. *J. E. Bradfield.*

26 June 1856.

was placed upon this Commission, and the gentlemen here were the subordinates of Sir James M'Adam.

1303. Sir *Benjamin Hall.*] Do you mean the Committee to imply, that in consequence of those two officers of the Metropolis Roads Commission being engaged to do work other than that which is under the immediate control of the Commissioners, they have not devoted so much time as they ought to devote to the duties of the Metropolis Roads Commission?—Either that, or the alternative, that the trust is very easily managed, because the evidence as yet given by those very gentlemen, is that it would require a large staff for the parishes to take to all those roads. Now I say, if the Committee find that these very gentlemen who say so are managing other trusts, I think differently.

1304. Are there any other points in relation to the management of the Commission to which you desire to call the attention of the Committee?—Yes; there is an immense quantity of granite lying in the open road from Kensington Town to Hyde Park Corner; and with reference to that advanced gate, I beg respectfully to submit to the Committee that it is a matter for inquiry what quantity of granite there is on that road, and to what extent it will repair the roads up to Kensington town; because as the removal of that gate has been petitioned for by influential gentlemen all round the neighbourhood, if it appears that there is a quantity of granite sufficient to maintain that road for one or two years, it does appear to me frivolous on the part of the officers of this Commission to oppose its removal, for I really believe they are the only gentlemen who do oppose it. It appears to me that there is an immense quantity of granite, which has not been touched for some months, lying on the side of the road next to Hyde Park.

1305. Sir *John Shelley.*] Is that a place of general deposit for granite?—I think it has been for some years; I think it has been the practice for several years to leave it there; but at present I am particularly struck with the vast quantity of granite there is there.

1306. Do you mean to imply that that vast quantity of granite is intended to be expended upon that road, or is it intended to be expended elsewhere?—If the accounts are kept separate for each district, and so it appears by the returns, that granite is intended for the Kensington district; and having that large stock on hand, I cannot see the loss that has been spoken of before the Committee; I may be wrong.

1307. Sir *Benjamin Hall.*] What course do you propose; you say that now there is a large stock of granite on hand there which would be sufficient for the maintenance of the road for two years, and therefore you suggest, I presume that it would be expedient to remove the toll-gate for two years; how is the road to be maintained afterwards; is the toll-gate to be replaced, or how?—With regard to the Kensington gate, the toll collected there can only be collected there from the parties who immediately go into Kensington town; because all the public conveyances, the Richmond, the Kew, the Isleworth, and the Hammersmith, have their toll collected at the gate to the west of the town; therefore the loss of revenue by the removal of Kensingtong ate can only be the loss upon the vehicles going into the town of Kensington. I have watched this gate, and seen gentlemen ride up in cabs and get out there; and I have conversed with the cab-drivers, and I find that it is the point at which they mostly stop and get out. I submit to the Committee that if the gate is removed, and there is a sufficient stock of granite to repair the road for two years, in two years' time the traffic must pay quite sufficient to repair the road and leave quite enough for the Commission, always supposing that I am right that there is a stock of granite on hand sufficient.

1308. Sir *John Shelley.*] How is the traffic to pay if there is no gate?—The other traffic, I believe, which goes beyond would pay it. There are a certain number of gentlemen who live up on the right of Camden-hill, who can avoid the gate if they please, and who do not pay toll. There is Mr. Slater, who only compounds for the toll, and there are a few of the inhabitants of the town who would be benefited by the removal; but the objection is to the situation of the gate. I am quite satisfied that the inhabitants of Kensington that I have mixed with do not object to pay a good rate; a rate either upon horses, if it were upon horses, or a rate upon their property; but what they object to is the toll-gate situated in the place in which it is. It opposes their going into the gardens;

dens; it is right at the entrance of Kensington Palace, and it also obstructs their getting down to the buildings which they are going to raise upon the lower ground. There is no good in introducing unpleasant matters before the Committee as to the Commissioners.

1309. I understand you to say that the omnibuses do not pay at that toll-gate?—They do not; they all come through the upper gate.

1310. Then the persons interested in the removal of that toll-gate are the persons, like Mr. Slater, who keep carts and carriages?—Just so.

1311. And it is in the way of going to Kensington Gardens; but can you tell the Committee any way in which the pedestrians, or those who do not go in conveyances in any way, are to be benefited by having a rate for the repair of the road?—What I say shows no necessity for any rate whatever. It appears by the accounts that there is 750 yards of granite belonging to the Kensington district. I see there is that stock upon hand now. I am quite sure, from the traffic, looking at the increase of buildings, that if that gate was removed, in two years the upper gate would supply any deficiencies that would arise, and the neighbourhood would be benefited.

1312. Would not the upper gate become a nuisance as great as as the Kensington gate is?—Not a greater nuisance than it is now; it is a nuisance now; but the great objection to removing that, I understand, is that it would increase the rates a shilling in the pound in the Hammersmith parish to remove the upper gate.

1313. Sir *Benjamin Hall.*] You mean that if the Kensington gate were removed, the income of the trust would be sufficient to maintain the road?—Just so. With reference to the ninth district, I humbly submit that the Commission owes the road money.

1314. Mr. *Hildyard.*] I find that the whole substance of your evidence is stated very logically and distinctly in that placard; I imagine that I owe to you the sending of that to me this morning (*showing the same to the Witness*)?—I sent it to you. I am an inhabitant of the district.

1315. Then it is part of the machinery of this association, is it, to issue placards of that sort?—That is an individual thing of my own. I am a rate-payer of the district.

1316. It is an individual thing of your own to issue a placard of this sort without your name to it, or without the printer's name, recommending the people to pay no tolls, but to evade the gates; is that so?—Certainly.

1317. You prepared the whole of this?—I prepared it.

1318. You therefore, in this placard, avoided all those obnoxious topics which you say it is desirable not to introduce before this Committee; have you introduced them into this placard which you have issued?—I have not referred to any of the officers; and as to their statements which I have referred to, I have only named them here as matters in consequence of the evidence which has been given.

1319. Has this been circulated merely in the neighbourhood, or was it prepared to send to the Members of the Committee?—It was circulated in the neighbourhood, and it was sent by me that it might not be imagined that I wished to conceal anything.

1320. Would not that have been better effected if you had put your name to it?—That is a matter of opinion; I differ from you.

1321. Sir *William Jolliffe.*] This, you say, is an individual action of your own, producing this bill and distributing it?—Yes.

1322. Is not this society that you represent a creature altogether of your own?—No; it is what I have told you; it is not entirely so.

1323. Would it ever have been in existence but for yourself?—I do not think that I have a right to take quite so much upon myself as to say that.

1324. Mr. *Hildyard.*] Now, I ask you before the Committee, do you think it was decent, having asked to give evidence before this Committee, previously to doing so to issue such a placard as that, and to send it anonymously to the Members of the Committee; do you think that was becoming in you?—I did not ask to be examined; I applied for certain questions to be put. I was present at the time of the examinations; I saw no opportunity of getting the information which I have referred to placed before my Lord and you, without applying to his Lordship and to the gentlemen on the Committee to hear me in the way of cross-examination, as representing the toll-payers.

Mr. *J. E. Bradfield.*

26 June 1856.

1325. Had you any reason to doubt that this Committee would hear you in your place, as a witness, to state anything you had to urge against this Commission?—I appeared in the previous proceedings as an agent, and not as a party.

1326. I ask you to answer my question; had you any reason to doubt that this Committee would give you an opportunity of stating, as a witness, anything you had to say against the Commission?—Certainly not.

1327. Then, I now ask you for the last time, believing that you might so state what you have to urge against the Commission, do you think it was decent anonymously to issue that placard?—I apprehend that, as a ratepayer and as a private individual, I was perfectly at liberty to take an independent course, and I consider I did so.

1328. I ask you whether you think it was decent to issue that document, which you have now got before you?—I certainly see no indecency in it.

1329. Will you be kind enough to give us specifically what your project is. As far as I collect from your evidence, you would abolish altogether the first Kensington gate?—Clearly.

1330. Sir *Benjamin Hall.*] Are there any other points to which you desire to direct the attention of the Committee in relation to the Commissioners?—In the inquiry last year on the Metropolitan Communications there were several questions addressed with reference to the Commission as to there being no party upon that Commission who represented the toll-payers; now I humbly submit to the Committee, that if the tendency of their minds should be to continue this Commission a change should take place in that respect. and that the toll-payers, or somebody who could represent them, with whom they could be in communication, should be on the Commission. I am told that it was perfectly impossible ever to get an interview with the Commissioners until very recently; that it was a sealed door; Mr. Green has told me as to writing letters and getting no answers; and when I applied, I applied with a memorial signed by 100 gentlemen, and the answer I got was that it was not the practice with the body to receive deputations. I believe through the kindness of my Lord we were heard, and were very courteously treated. But with reference to the Commission, I do submit that if it is continued, a change should take place in the mode of representation. The Tower Hamlets, in which we have got a great number of gates, is a borough that has been created, and so has Marylebone been created since this Act of Parliament making this Commission; the Members of Parliament for those districts are not on the Commission at all. With reference to the City-road, I think that has been gone into.

1331. *Chairman.*] I observe that there has been presented here this year a petition by General Wyndham; it is signed by Rickett, Smith & Co., Lea & Co., Thomas William Rhodes, and others; are you acquainted with that petition?—Yes; those parties I represent as a body, certainly, though I could not call them an association or a society; but all those gentlemen are at my back, as I may say, and have all been urging me to get it carried out.

1332. This petition then represents your sentiments?—Just so.

1333. I observe that the prayer of that petition is that the Commission shall be abolished, and that the trust should be transferred to the Metropolitan Board of Works?—Just so.

1334. Is that your wish?—From the evidence which has gone forward. I hardly know whether that can be my wish, because I should see some difficulty about that in the rating of the parishes.

1335. Will you inform the Committee what your reasons were, at the time you framed this petition, for desiring that that should be done?—Because the Board of Works is an open body, and this is a closed one; because the Board of Works have the under surface of the ground under their control, and therefore it would be a very great saving if the upper ground was also committed to them, as there is a constant change always going on, and a cost to the ratepayers or the toll-payers, whichever they may be, for the breaking up of the roads; whereas, if the whole road, the top road and the under road, were vested in one body, the effect would be a very great saving. That was the reason I had for proposing that the Board of Works should take to this Commission.

1336. Do you still adhere to that opinion, or has the evidence you have heard induced you to modify that opinion?—Very slightly; only in relation to this, that I think it would be a great injustice to such parishes as St. George's, Hanover-

Hanover-square, and St. Luke's, Chelsea, and other parishes who have already taken to their roads, that they should pay another rate for other roads.

1337. Was it your proposal here that there should be a new system of rating for the maintenance of the whole of the roads over the whole metropolitan area?—That was the first proposal; I alter that now to make the rating apply to the parishes for their particular amount of roads.

1338. By "their particular amount of roads," do you mean that amount of roads which is now in the Metropolitan Roads Trust?—Just so; therefore, as far as the principle goes for the change, I adhere to it.

1339. Sir *William Jolliffe.*] You first of all advocated that there should be a general rate, to extend throughout the metropolis, for the repair of those roads?—I do not think I advocated it; I think it came out before Lord Lonsdale; it was hardly a question of advocacy.

1340. Now you think that each parish should maintain its own roads?—I think that each parish should pay for its own roads, and that those who have the care of the upper ground should have the care of the under ground.

1341. Then there should be one management for the sewers as well as the roads?—Clearly.

1342. And that you think would be an advantage?—It would be an advantage; it would save a great deal in the constant breaking up of the roads for water, and gas pipes, and sewerage, and it would secure as well to the metropolis very good roads.

1343. Do all the parishes in the metropolis, which have the repair of their own roads, keep them in good order. Take St. Martin's-in-the-Fields, for instance, do they repair all the highways within St. Martin's-in-the-Fields in a satisfactory manner?—I believe so, as far as I know.

1344. Are you acquainted with Charing Cross and Cockspur-street?—I do not know whether that is upon St. Martin's, or whether it is with the Woods and Forests; but according to the evidence given here, the Woods and Forests maintain their roads much cheaper than the others do theirs, because Mr. Browse has given in evidence that the expense of Regent-street was 3,400 *l.*, and that of the City-road 2,300 *l.* Now the amount of traffic upon Regent-street is three times that upon the City-road, and if the Woods and Forests can maintain one mile of Regent-street for 3,400 *l.*, I think the City-road ought to be maintained for about 1,100 *l.*, and not for 2,300 *l.*; and if you notice, Regent-street is on an incline too.

1345. Are you speaking now of the evidence which has been produced here of gentlemen who have taken the traffic?—Yes, the parties I instructed to take the traffic.

1346. They were instructed by you?—Yes; and if there is any doubt about the traffic, I hope the Committee will have some independent party to take it at the same place.

1347. At what point of Regent-street did you have your traffic taken?—I think it was about Beak-street; if it had been at the lower part, it would have been more; I think it was Beak-street.

1348. Do you suppose that the state of Regent-street about Beak-street is as good as that of the City-road in point of maintenance?—I may be not so good a judge as other people; is it fair to ask me that question?

1349. Sir *Benjamin Hall.*] I understand from that petition presented by General Wyndham, which was printed by order of the House of Commons, that your desire was in the first instance to transfer those roads to the Metropolitan Board of Works?—Yes.

1350. How did you propose that the Metropolitan Board of Works should maintain the roads?—By a parish rate. I understood that it was the intention of Parliament, when it appointed the Commission, that the Commission should not be perpetual.

1351. Did you mean by a general metropolitan rate, such a rate as they are empowered to levy under the provisions of the Act of last Session, or that a power should be given for making a special rate for repairing a particular district?—My first proposal was a general rate; I wish to modify that, because I see it is quite impossible; it would be an injustice to certain parishes to carry it out, and therefore there ought to be a highway rate.

1352. Therefore your desire now is, that the toll should be abolished, that the roads should be thrown upon the parishes, and that the expense of maintaining

Mr. *J. E. Bradfield.*

26 June 1856.

taining the roads should be defrayed by a rate over the parishes through which the roads pass?—Just so.

1353. *Chairman.*] That each parish should be rated for that part of the metropolis trust road that passes through it?—Yes; otherwise how very unfair it would be for St. Pancras, for example, which has got a good trust of its own, to pay for others who have not.

1354. Sir *Benjamin Hall.*] You state your desire that the parishes should maintain those roads, by which of course an additional rate would be placed upon the parishes for the maintenance of the roads?—Yes.

1355. You have stated in the communication read by the Chairman, and you say it has been stated in evidence here, that one half of the entire tolls of the metropolis are paid by those parties whom you represent here, the omnibus proprietors?—Yes, upon the authority of Mr. Browse's evidence.

1356. Would any benefit accrue to the ratepayers of the metropolis by taking the roads upon themselves, and placing 26,000 *l.* a year in the pockets of the omnibus proprietors?—I apprehend in some districts very great benefit would accrue to the district, in others it might not be so great; there would be a greater amount of accommodation, and more regular accommodation; there would be some places where the omnibuses run upon parish roads where they would go a more direct route. In some places they go a circuitous route in order to avoid the gate. It would open up districts that are not opened up now, and would add greatly to the improvement of the metropolis.

1357. What benefit has accrued to the inhabitants of any district where the tolls have been materially reduced, or where they have been abolished?—I believe the toll-bar originally stood at the King's-road, where the Royal Blues now go. The benefit to that district has been, that they have obtained a constant communication to the city, opposed by steamboats on the Thames even at 2 *d.*; the omnibuses carrying them all the way to the Bank and Leadenhall-street for 4 *d.* The benefit to Chelsea has been in the regular supply of omnibuses there at a low fare. The benefit to Brompton was this, that when the gate was removed lower down the omnibuses posted themselves further down, at the Gunter's Arms, where a new neighbourhood has now sprung up, and an increase in the supply of omnibuses has taken place to that district.

1358. Now, take the Brompton district and the Chelsea district, which you have cited; when were the tolls lowered, or abolished, in that district?—I think it was in 1845, about 10 years ago.

1359. Now, let us take a recent case; take the ninth district, where the tolls have been reduced from 33 per cent. within the last year or two; what benefit has accrued to the inhabitants of that district by the reduction of those tolls?—You cannot make out a case against me there, because there could be no benefit, insasmuch as the omnibuses were contracted for in that district, and therefore any reduction was a reduction to the public and not to the omnibus proprietors. But I believe it caused additional vehicles to be put on. The omnibuses there pay by contract; therefore being a contract, there was nothing reduced, I believe.

1360. When was that contract entered into?—Some years ago. It was reduced two or three years ago to 4 *l.*, I believe.

1361. Are you speaking of the gate where the 4 *l.* is paid?—Yes.

1362. But I am not speaking of that gate, but of the other gate where the toll was 3 *d.*, and where it has been reduced to 2 *d.*?—The upper gates, the Hampstead and Highgate, have all been contracted for; at least, I believe so. There is no diminution in the charge to the omnibus proprietor, and therefore no corresponding benefit could be expected.

1363. How long does the contract last?—I cannot say.

1364. It appears in evidence before the Committee that there is no difference between the charge upon lines where there is a toll, and where there is no toll; how do you account for that?—I think there is no difference in the charge, but there is a greater amount of accommodation. If you take the map, and look there, for instance, with reference to the case stated by Mr. Barber, before the 4 *d.* omnibus was established to Stoke Newington, the inhabitants would have to walk up to the Hackney-road, and then catch the 6 *d.* omnibus; they would have to be taken, perhaps, three quarters of a mile further on, having to walk thus a mile and a half to the 4 *d.* omnibus; therefore the establishment of an omnibus in that district was a benefit.

1365. Take

Mr. *J. E. Bradfield.*

26 June 1856.

1365. Take the case of the line from Paddington to the Bank; there are no tolls upon that line, and yet the charges are the same there as upon the lines where there is a toll?—I do not think that it is according to the distance. If you take the distance, there is a 4 *d.* fare upon some part of that line, and a 6 *d.* fare beyond the gate.

1366. Where do the omnibuses start from upon the Paddington line within the turnpike area?—Kilburn. As soon as the gate was removed up there the omnibuses followed up to the gate, charging no extra fare for the upper ground.

1367. From where does the great majority of the omnibuses start upon the Edgware-road line?—I cannot say; Mr. Lines can tell you.

Mr. *Augustus Lines*, called in; and further Examined.

Mr. *A. Lines*, and Mr. *Bradford*,

1368. Sir *Benjamin Hall.*] CAN you state the place from which the omnibuses start on the Edgware-road line?—From "The Royal Oak." The Kilburn-gate omnibuses used to start from Newcastle-place.

1369. What is the distance from the Royal Oak to the Bank?—Five and a quarter miles.

1370. How is that divided as regards fares?—From the Royal Oak to Regent-street, or from Kilburn-gate to Regent-street; and from Tottenham Court-road to Whitechapel or the London Bridge station. It used to be originally, before the gate was removed, from the Wheat Sheaf to the Bank.

1371. What is the charge for the whole length to the Bank?—Sixpence.

1372. What are the intermediate charges, taking the Oxford-street line first?—Fourpence from the Royal Oak to Regent-street. The whole of the Royal Oak and Kilburn-gate omnibuses go down Holborn.

1373. The line of road is from the Royal Oak to the Bank?—Yes.

1374. Then I want to get the divisions of that line. The first portion of the line is to the Regent Circus?—Yes.

1375. The next portion of the line is to Tottenham Court-road?—The next is from Tottenham Court-road. Beyond Regent Circus they are 6 *d.*

1376. Between Regent Circus and Tottenham Court-road there is a space?—It is a 6 *d.* fare, which is filled up by some short omnibuses that work over that ground.

1377. I am to understand you that there is a line of omnibuses from the Royal Oak to the Bank?—Yes.

1378. Running through Oxford-street?—Yes.

1379. And that that line is divided into three sections?—Yes; taking two and the long one.

1380. The first section being from the Royal Oak to Regent Circus, for which they pay 4 *d.*?—Exactly so.

1381. From the Regent Circus to Tottenham Court-road, for which they pay 6 *d.*?—Yes, which we call "All the way;" a person can ride all the way for 6 *d.*

1382. From the Regent Circus to Tottenham Court-road is a space for which, if they enter the omnibus and get out at Tottenham Court-road, they pay 6 *d.*?—They would.

1383. And the other section is from Tottenham Court-road to the Bank, for which also they pay 4 *d.*?—Or to London Bridge.

1384. If they go the whole length from the Royal Oak to the Bank, how much do they pay?—Sixpence.

1385. (To Mr. *Bradfield.*) Mr. Lines having stated to the Committee that from the Royal Oak to the Regent Circus is a 4 *d.* fare, that from the Regent Circus to the Tottenham Court-road, if a person should avail himself of the omnibus he pays 6 *d.*, and that from Tottenham Court-road to the Bank he pays 4 *d.*, upon which line there is no toll whatever; what benefit will accrue to the public from the abolition of the tolls?—I can hardly answer that question as to the road upon which you put it. I do not see in the particular district to which you have referred, the Paddington district, that there are any tolls, beyond the Notting-hill gate, that the omnibuses go through at the present moment.

1386. But the question I ask you is this; can you show the Committee that

Mr. *A. Lines*, and Mr. *Bradfield*.

26 June 1856.

any benefit will accrue to passengers by omnibuses by the reduction of fare, supposing that the toll-gates shall be removed?—With reference to the reduction of fare, if you will take the amount of toll paid at the advanced gate by omnibuses, it is so very small that it would hardly show a fraction per passenger, so that that could hardly be expected with reference to the advanced gates. But with reference to the upper gates, I do think there might be another division of tolls to the advantage of the inhabitants in certain districts; but which those districts are I would not like to pledge myself at this moment, unless I was to study the locality well. The Royal Blues run a greater distance than formerly, and Chelsea is benefited, and all the neighbourhood where the tolls were reduced has been improved by buildings springing up.

1387. Then, in point of fact, you cannot state to the Committee that, if the tolls were established, there would be a reduction of the fares?—I cannot go so far as that, because I am not authorised to say so. I am not an omnibus proprietor.

1388. But from your acquaintance with the roads, can you tell the Committee that there would be a reduction in the fares to passengers if the tolls were abolished?—I will not pledge myself to answer that question in the affirmative; I believe it would be so. Indeed it must follow in certain districts; I may almost name the Hampstead district and the Kentish Town. I think that there would be a benefit to all the districts in the upper ground, as the fares are higher in those districts now than they are upon the lower ground.

1389. According to the statement which has been laid before this Committee, it appears, taking the case of the parish of St. Pancras, there are seven miles and two furlongs of metropolis roads in that parish, and that the estimated cost of the repairs of those roads is 5,600*l.*; I understand from your evidence that you desire to abolish the tolls within that district, and to throw the charge for the maintenance of those roads upon the ratepayers of the parish. Can you offer any corresponding benefit to the ratepayers of that parish if they take upon themselves the repair of those roads?—With reference to the ninth district, that is not my case. My case with reference to the ninth district is, that that the Commissioners owe that district money; that they ought to pay that balance over to the parish; that that is part of the money of the omnibus proprietors.

1390. That is not an answer to my question, which is this: it appears by a Paper presented to this Committee that there are seven miles and two furlongs of road in the parish of St. Pancras that are maintained at an estimated cost of 5,600*l.*; I want to ask from you, supposing the ratepayers took these roads themselves, what corresponding benefit, if any, would accrue to them from taking the expense of 5,600*l.* (which is equal to a rate of 6*d.* in the pound) upon upon themselves?—I think in districts there would be increased accommodation; in the case of St. Pancras, I know that money has been raised to pay for increased accommodation on account of the want; the inhabitants have had to pay for increased accommodation; but as to the fares, I will not pledge myself.

1391. There would be increased accommodation, inasmuch as there would be an increased number of omnibuses, but the fares would remain as they are at present?—I will not pledge myself, not being an omnibus proprietor; but I think the natural consequence would be that the fares from the upper district would be lowered. I know a district which is now in the course of building, and there are builders and parties in the district who have raised money among themselves in order to get the omnibuses up there, with a view to the improvement of their property.

1392. That is, the builders in the northern portion of the district?—Both at Islington and Holloway they are paying money for the purpose of having omnibuses up there.

1393. You mean the builders in the northern portion of the metropolis?—I mean Kentish Town and the back ground, the intervening district, including Islington.

1394. But you must be aware that that is the thinnest inhabited portion of the whole parish?—I am quite aware that it is; but houses are springing up at the present time there very rapidly.

1395. *Chairman.*] You cannot get to that district without going through gates?—We cannot get to that district without going through gates. At the present time that district is paying a certain sum to keep the omnibuses which

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go through the gates up there. I know of two omnibuses communicating with the Regent's Park right up the villas into Holloway that were taken off on account of the toll-gate; they are not running now, but I am quite certain that those omnibuses would exist but for the extra amount of duty and the tolls; and there may be a chance that that communication between the two places may be re-opened.

1396. Sir *Benjamin Hall.*] Do you mean to say that if the tolls were abolished, and the 26,000 *l.* a year paid by the omnibus proprietors for the maintenance of the roads should be placed in the pockets of the omnibus proprietors, the accommodation which would be derived by the public, and the benefit which would accrue to the public would be in the shape of an increased number of omnibuses rather than in the reduction of the charge for traffic?—Yes.

1397. Sir *William Jolliffe.*] Do you think that the number of the omnibuses would be very much increased throughout the metropolis supposing the tolls were abolished?—In the back districts the distances would be lengthened. I do not see that the number of omnibuses would be increased, but if the owners ran them ten miles or even five miles a day further, it would be a very great accommodation to some districts, in the morning and evening particularly.

1398. If they would run them further there would be necessarily more of them?—No; you can run an omnibus 60 or 70 miles a day which only now runs 40, and it is a benefit to the district and a benefit to the Government also in the shape of increased duty.

1399. But the omnibuses must be increased or the public would not have a greater accommodation, because the shorter the distance the oftener it repeats its journey, and therefore the greater the distance, necessarily the less often it repeats its journey?—I am speaking of the greater mileage they may go in running out for the accommodation of the districts; by going a greater distance they do actually increase the number of miles.

1400. If they run further, the number must be increased?—If you increase the mileage it is just the same. I mean any particular omnibus can increase its mileage from 40 to 60 or 70 miles, and give an extra accommodation to the public, but it is not necessary that another omnibus should be put on; that would be an increase of the wear and tear considerably.

1401. But if those distant roads, which are not now used by the omnibuses, became used by the omnibuses, by the extinction of the gates, would not the wear and tear upon these roads be infinitely increased?—Certainly.

1402. And the expense of their maintenance would be also increased?—I do not think increased beyond what is expended now.

1403. It is your supposition that they are now maintained at an excessive cost?—Yes.

1404. And therefore you put your opinion, in that respect, against the fact that the additional omnibus traffic must necessarily increase the wear and tear?—It might have that inference.

1405. Have you calculated what advantage the omnibus proprietors would gain by having this extended distance to travel over, toll free, besides and above the 26,000 *l.* which they would gain in tolls?—Do you mean by the removal of the advanced gates?

1406. Supposing all the gates were removed?—I have not done that, but it is a matter that has not entirely escaped my attention. I should tell you that the more mileage an omnibus goes, the more duty the Government gets, therefore the Government gets something, although the parishes may lose; we shall have to pay more duty.

1407. Can you say, by the reduction of the mileage duty, what benefit has accrued to the public?—Vast. If that had not been granted you would have seen every omnibus proprietor, or the greater number of them, in the Gazette. Omnibuses were rapidly disappearing; indeed, it was a country question; the prayer was for an entire alteration, and a reassessment of those duties, upon the principle of the post-horse duties. The Chancellor of the Exchequer admitted that there might be something in it, and we tried to get, through the exertions of his Lordship and Sir John, some instalment, in order to keep the trade together, when certainly the trade was very bad indeed; that was an instalment, and at the present time, I believe, we pay something like 80 *l.* a year a vehicle; that reduction was only one-third.

1408. This reduction of one-third has been the salvation, you consider, of the

Mr. *A. Lines*, and Mr. *Bradfield*.

26 June 1856.

the omnibus interest?—I do; and the country coaching trade. I have been very much amongst them. I know the coaching trade could not have held together without. It enabled many of them to keep their things together; they were selling off at the time.

1409. What has been the amount of saving from the reduction?—I think it was 100,000 *l.* throughout the united trade, or 120,000 *l.* going into Scotland too; that would be all over the country.

1410. How far were the omnibus proprietors benefited?—I think they saved between 30 *l.* and 40 *l.* a carriage per year. You must remember, at that time, the price of provisions; it was the case, that what with the price of provisions at the particular moment, and the price of horses, the trade was in a very unhealthy state.

1411. And therefore the public have retained the advantage of having omnibuses, which you contemplate they would have lost if it had not been for that reduction?—I almost think that they would have lost them, because the reductions were going on very rapidly, as has been proved.

1412. Sir *John Shelley*.] You have stated that, in the event of those tolls being taken away, although there would be no increase in the number of omnibuses, an additional amount of accommodation would be given by the extra number of miles they would run?—I apprehend that would be the result; there would be an increase of course in certain neighbourhoods, when further built upon.

1413. If an omnibus goes double the distance that it did before, surely the district it formerly ran over loses during the time it is going the extra distance, and so far as that distance is concerned there is no extra accommodation?—On the contrary, where they did 40 miles a day before, they would do 60; therefore the district would gain, not lose.

1414. They would go oftener in some cases?—Yes.

1415. Mr. *Wrightson*.] Is this a fair view of your case; an omnibus holding 12 inside passengers at 4 *d.* a piece produces 4 *s.*, that omnibus passes through a gate on which the charge is 6 *d.*, so that that toll is an eighth part of their receipts?—Supposing it was full inside, and there were no others, it would be so.

1416. Then the toll would be an eighth part of your receipts, as far as regarded those passengers?—As far as regarded those passengers.

1417. Would it not be the same thing to the omnibus proprietor to have a fare of 3 ½ *d.*, paying no toll, which would give him just as much profit as a 4 *d.* fare paying a toll?—Clearly, if that was the case; but in practice it is not, because the omnibuses are never full throughout the day; you are quite right, assuming the omnibuses to be full, but they never are throughout the day.

1418. A halfpenny would be the toll for every passenger?—Yes, that would be quite fair if the omnibuses were full.

1419. Mr. *Hildyard*.] Supposing the omnibuses do not run full, they keep taking up and putting down; do you mean to say that an omnibus running the whole distance does not fill by taking up and setting down?—Yes, that is quite right; there are sometimes a few in, and sometimes a great many.

1420. Have you any doubt, speaking generally, taking into account the persons which they put down, and others which they receive, that omnibuses generally speaking, in passing over the journey, have more than 12 inside?—I consider that they do in some districts, throughout the day.

1421. Taking into account that whether the omnibus may be full or not at starting, they put down two or three, and take up two or three, and so on, have you any doubt that more than 12 are in the omnibus on the journey?—Do you mean to say both ways?

1422. I am speaking of one journey; an omnibus has the power of carrying 12 inside, and how many out?—They vary; there are nine, and there are 12 and 14.

1423. Take 12 inside and 12 out, taking into account that they constantly put down passengers when they have run only a portion of the distance, and take others in in their place, have you any doubt that upon the average the omnibus carries 12 persons a journey?—I would rather look at the general returns before I answer that; I could ascertain the general average by the receipts.

1424. I wish to have distinctly your proposal to the Committee with respect to

to the removal of gates. Kensington gate, on the main line, I understand you recommend should be removed altogether?—Yes.

1425. Go *seriatim* through all the gates which you propose to remove?—The advanced gates.

1426. All the gates which you propose to remove; I should like to have them mentioned *seriatim*?—The general object was to remove all the gates; but I submit that the Commission could remove those to which you direct your inquiry.

1427. I now ask you what is your proposition to this Committee; is it to remove all toll-gates, and cast the roads upon the parish, or not?—It is, for the reasons I have already given, the primary object. You were directing your question to the advanced gates; I said they could be removed by this Commission in case the Act of Parliament did not take effect.

1428. But I wish to know what your proposal is for the consideration of this Committee; it is to remove all toll-gates and cast the expense upon the parish, is it not?—It is.

1429. You certainly, at an earlier period of your evidence, said that it would require some modification as to casting the burden upon the parishes, and you mentioned St. Luke's, did you not?—What I meant to say was this, that at first I thought there should be a general rate by the Board of Works, but upon reconsideration I thought it would be very unjust to such parishes as St. Luke's, that had already taken to its roads, to be taxed again, or St. George's, Hanover-square, and other parishes; it would be also unjust to St. Pancras.

1430. Therefore, excluding that modification, you would have every parish maintain the roads which run through it?—No, not the parishes; I do not say that; what I say is, that the Board of Works, being an open Board, having the control of the underground of those roads, could well repair the whole of them in the manner I have already stated.

1431. Then you state that your proposition to us is to abolish all gates, and to let the parishes through which the roads run, which would have to be maintained otherwise than by tolls, be maintained by a parish rate upon each?—Yes, for the reasons which I have given.

1432. That is your proposal?—Yes.

1433. Mr. *Bonham Carter.*] I understood that you gave up your original idea of a general rate upon all the parishes through which the metropolitan roads run, because that would be making certain parishes which now maintain their own roads pay for roads which do not run through them?—Clearly.

1434. But supposing the roads throughout the whole district were amalgamated, would the same objection still exist?—It might require modification on account of the ground I have stated about the ninth district; there is a question about the ninth district which renders any specific answer rather difficult in that case.

1435. That single reason is not sufficient, because it might be answered by saying that those other roads might be thrown in, and then a general rate made; there would be no injustice to the parishes then?—I gave the proposal with the view of showing that my rating would be the most just mode of assessment.

1436. Sir *Benjamin Hall.*] As you have appeared for the omnibus proprietors, will you inform the Committee what is the state of the omnibus trade now in London; how many proprietors are there?—There are not so many; they are more consolidated into a large company, the general company.

1437. What number of companies, or individuals carrying on the trade, does the omnibus trade consist of at present?—There are the same parties engaged in the trade, though not as proprietors.

1438. That is not an answer to the question?—I cannot precisely say the number.

1439. How many omnibus companies are there existing at this time in London, or proprietors?—They are under 16 I think at this time.

1440. Sixteen distinct companies?—Certainly under 16.

1441. Under 16 distinct companies?—Yes.

1442. Independent of those 16 distinct companies, are there any persons carrying on their own private trade?—Very few I think.

1443. Are there any?—There are some.

1444. How many?—They are what are generally working into the more

Mr. *A. Lines.*

26 June 1856.

remote districts of London, so that we come very seldom in contact with them; there may be 20 of them, but I cannot say.

1445. Take the area which is included under the Metropolitan Act of last Session; are there any persons carrying on trade in omnibuses excepting companies?—I am not aware that there are; there may be one or two small masters, but I think not; there are one or two up in the green lanes, I think, that do not belong to the companies.

1446. In point of fact, the omnibus trade of London is now in the hands of less than 16 different companies?—Certainly.

1447–8. Can you tell us exactly what the number of them is, how much less than 16?—(Mr. *Lines.*) The associations are remaining as they were; they are only partially bought up by the general company; I suppose the company have about half the carriages, perhaps a little over half the carriages in London, and the other proprietors are working in connection with them in associations. Of distinct companies, I believe there are but two, the Richmond and the London Omnibus Company; the others are associations which have been always carried on upon the principle of association of roads; associating their money together to prevent racing on the roads, and dividing the time.

1449. Sir *William Jolliffe* (to Mr. *Lines*)]. So that, in fact, there are only two companies?—I believe there are only two companies.

1450. Are there more than two that have distinct interests?—There are very many proprietors.

1451. Then I am to understand from you that there are, in fact, two companies of omnibus proprietors within the metropolitan area?—Yes, namely, the Richmond and the London General Omnibus Company.

1452. Have those two companies bought up the interests of the former proprietors?—The Richmond company has been established for years, and is precisely in the same state now as it has been for years. The great General Omnibus Company has been established about six months, and has bought up the interest of many of the proprietors to the extent of something like half, or rather more than half the trade of London.

1453. In point of fact, supposing the tolls were reduced, the 26,000 *l.* a year which is now paid, or has lately been paid by the omnibus proprietors, would go into the pockets of the companies?—Providing they had the whole, and providing you have the amount correct; but it would depend upon the nature and state of the roads whereupon the property worked, because there is a great deal of omnibus property which pays no toll whatever.

1454. But whatever may be the amount of the toll, the abolition of the toll would be to the benefit of the companies who have the omnibuses now?—Of the proprietors.

1455. Mr. *Alcock.*] Would not you say that the fare of omnibuses depends more upon the amount of the competition than upon the amount of toll?—I think it depends more upon the neighbourhood you are working in; for instance, we will take the line of omnibuses working from the Marble Arch to Farringdon-street, which is a very thick neighbourhood; the consequence is, that they are working there for 2 *d.* from the Marble Arch to Tottenham Court-road, which supplies the 6 *d.* district Sir Benjamin Hall was alluding to before; and they charge 2 *d.* from Tottenham Court road to Farringdon-street, or 3 *d.* the whole distance; that being a thick neighbourhood, and no toll to interfere with them, they can supply a better class of accommodation at a lower fare; another district, from Hungerford Market to Camden Town, is a thickly populated district; they are supplied at two 2 *d.* fares, and a 3 *d.* fare the whole distance; the toll there being a nominal toll, it does not interfere with them; but before there was a contract for that toll those omnibuses turned round at the gate, and there is no doubt that would be the effect again, provided a bar was put up so that they could not evade them; the consequence would be, that that part of the neighbourhood which is accommodated would be shut out; they would have only long omnibuses to accommodate them.

1456. Sir *John Shelley.*] Are the two companies running from the Marble Arch to Farringdon-street competing companies?—No, they are not competing companies; the London General Omnibus Company have a portion of them, and the other parties the other.

1457. Sir *Benjamin Hall.*] Then what the Committee are to understand is, that in consequence of the amalgamation of various interests of late, there is no competition

competition whatever within the metropolitan area as regards omnibus traffic?—I do not think there is anything that you would call antagonistic.

1458. Then the whole thing being now constituted in one company, what is it that settles the fares to be take upon the different lines?—Each road, each district, settles the fare in its own case.

1459. Is it not settled by the general company?—No, it is not; there are distinct committees for every district, Camden Town, Kentish Town, Hampstead, Kensington, and Paddington, what we call the "Atlas," and "Waterloo," and various others, which I cannot remember; perhaps 20 more.

1460. Then I understand you that there are committees to represent the different lines of omnibuses?—The different districts.

1461. The different districts through which the omnibuses pass?—Yes.

1462. And those committees settle the fares that shall be taken?—Yes.

1463. Then do all the monies that are received go into hotch-potch, to be divided afterwards amongst the proprietors?—No, that is not the fact; they do as far as each district is concerned. Take the Camden Town district for one, take Paddington for another, and Hammersmith for another; each district settles its own fare, and makes its own division. It is not a general fund for the whole of London.

1464. Then are there separate accounts kept for each district?—Yes; the New-road is a separate district from Oxford-street, although it goes to the Bank.

1465. Then although there are separate accounts kept for the separate districts, yet the whole is under one general control of a company?—No; that is not the fact; the management of each road is under the control of its own committee.

1466. But the whole is consolidated into one company?—No; I do not say so.

1467. But there is a General Omnibus Company, is it not?—Yes; but what portion of the general trade of London is bought by the General Omnibus Company divides with the various associations.

1468. There are different associations united in one company?—No; it is not so, except where there have been various ones bought up by the company.

1469. Then if these different districts have a separate interest for each different district, how is it that they form part and parcel of a whole company?—I will give you an instance. I myself have a small property, but I have an interest on two lines.

1470. But is that not for the purpose of preventing competition?—I do not know that it is; it is for the purpose of the better accommodation of the trade of London, because it certainly cannot be for the benefit of the public to have two omnibuses racing together.

1471. But it is for the benefit of the trade that they are associated, is it not?—I apprehend so.

1472. Is it not also for the purpose of avoiding competition?—Yes, probably we may take it in that way.

1473. Mr. *Hildyard.*] Is it within your knowledge that the General Omnibus Company has it in consideration to buy up the steamers upon the Thames?—I should think not.

1474. Have you not heard that there is such a scheme by any one; by some other company?—I have heard that a company has bought them up, but not the General Omnibus Company; however, it is a very vague rumour as far as I am concerned.

1475. Mr. *Butler.*] Can you give the Committee the number of omnibuses crossing Waterloo Bridge daily?—I think it is 17.

1476. Can you give the number crossing Southwark Bridge?—Very few; I think one or two.

1477. How do you account for the much greater omnibus traffic over Westminster and Blackfriars Bridges?—I suppose partly the neighbourhood, and probably the toll may have some influence upon it.

1478. Are you of opinion that the toll prevents increased traffic over Southwark and Waterloo Bridges?—I have not studied it sufficiently to say, but I should think it is very probable.

Mr. *A. Lines* and Mr. *Bradfield.*

26 June 1856.

1479. Can you give the fare from Hackney to London; is it 4*d.*?—I am not sure; I think it is so.

1480. Can you tell me the fare from Kingsland?—Threepence from Kingsland-gate.

1481. The toll is abolished at Kingsland, is it not?—They do not go through the gate; there is one gate discontinued that they did run through.

1482. If the toll-bar were put up again, I suppose there would be an increased fare, would there not?—More probably we should shorten the distance of the omnibuses.

1483. Sir *William Jolliffe.*] Is Waterloo Bridge contracted for by the omnibuses?—No, I think not.

1484. *Chairman.*] You are very well acquainted with the omnibus traffic, are you not?—Pretty well.

1485. The omnibuses in the metropolitan district carry in each year some millions of passengers, do not they?—They do.

1486. The descriptions are from high class to low class, are they not?—Certainly.

1487. Whatever interfered with your omnibus business throughout the metropolis, would necessarily interfere with the carrying of those millions of people, would it not?—Certainly.

1488. Is there anything in the omnibus traffic to make it impossible, should the present proprietors seek for exorbitant profits, for others to enter into it, and compete with them?—I think not.

1489. Mr. *Hildyard.*] Suppose an individual started against those two companies, do you mean to say that they would not both of them combine to crush him immediately?—I certainly think they would not, because they are two companies, and there is no communication whatever between them.

1490. Have you not already stated that your object was to avoid competition, and is not that an answer to the question I have put?—No, it is not, because you put the positive fact, "Would they combine to run a person off?" I say there is no combination between them at all; at the present moment there is no connexion between them, neither do I believe there would be in that case.

1491. Suppose any individual interfered with the monopoly of either of those two main sections, do you mean you would not run that man off the road?—I cannot say.

1492. Did you ever hear of the old days of stage-coaches; when they attempted to put a new stage-coach on the road, was not that always the practice of the old-established line?—Of a great many.

1493. *Chairman.*] Is there anything particular in omnibus traffic to make it impossible, supposing you get exorbitant profits, that other individuals or companies should come in?—I think not.

1494. Sir *John Shelley.*] As regards the Richmond Company, has any negotiation taken place between the Richmond Company and the General Omnibus Company for an amalgamation?—Certainly not to my knowledge; I believe there has been none.

1495. (To Mr. *Bradfield.*) Have you any proposal to make to this Committee in order to induce them to advise the taking off those tolls other than putting the expense upon the parishes; is this Committee to understand that you have no other proposal to offer in order to make up for the loss of toll than putting the expense of maintaining the roads upon the parishes?—I have not, for the reasons stated, and also because the debt is paid.

1496. *Chairman.*] Did you not state that the advanced gate at Kensington might be taken away, and the road repaired, without any expense to the parish at all?—That is my opinion.

1497. Sir *John Shelley.*] But I say, as regards the general tolls throughout the metropolitan district, have you or not any other proposal to make to this Committee, than that of throwing the burden of maintaining the roads upon the parishes?—Not as regards the general question.

1498. Mr. *James MacGregor.*] With reference to the Kensington-road, do you mean to state that a number of people there have devoted a certain sum of money to the repair of the roads?—Not the Kensington-road; that is in another district; the Kensington district I put upon the quantity of material they have on hand.

1499. Having

1499. Having provided a large supply of material, they are to use it for the next two years without charging the parish?—By economy I think they could, and under proper surveillance.

Mr. *A. Lines* and Mr. *Bradfield.*

26 June 1856.

1500. *Chairman.*] When you stated that your proposal was the entire abolition of the toll-gates, did you mean the whole of the toll-gates in the trust, or only those within the district of the Metropolitan Local Board of Works area?—I confined myself to this trust.

1501. Did you mean the whole of the turnpikes in the trust?—In the trust.

1502. The whole of them?—The whole of them.

Lunæ, 30° *die Junii*, 1856.

MEMBERS PRESENT.

Lord Robert Grosvenor.	Mr. Hildyard.
Mr. Bramston.	Mr. Wrightson.
Mr. Hastings Russell.	Mr. Alcock.
Colonel Pennant.	Mr. James MacGregor.
Sir Benjamin Hall.	Mr. Butler.
Mr. Alderman Challis.	Sir William Jolliffe.
Mr. Bonham Carter.	Sir John Shelley.
Mr. Wyvill.	

LORD ROBERT GROSVENOR, IN THE CHAIR.

The Right Honourable the Earl of *Lonsdale*, attending by permission of the House of Lords, Examined.

1503. *Chairman.*] I BELIEVE you are a member of the Metropolis Roads Commission, and have been since its commencement, have you not?—Yes, I carried the Bill. I moved for the Committee in the House of Commons, and after the Report of that Committee, I was instructed, as I remember, to bring in a Bill the following Session.

Right Hon. *Earl of Lonsdale.*

30 June 1856.

1504. Which Bill was brought in, which is the 7th of George the Fourth, chapter 142, passed in 1827?—Yes; it originated primarily in the Committee of Mr. Protheroe of Bristol. In the year 1819, there was a very full examination respecting all the tolls and turnpikes of the kingdom; there had been a previous consolidation at Bristol, and it was recommended that there should be, not a similar Commission, but one based upon that respecting the tolls round London. I think Mr. Davis Gilbert brought in a Bill afterwards to consolidate all roads, south and north, and he was beaten. I took a more limited course in proposing that the turnpikes north of the Thames should be consolidated, and that was carried by Parliament after a good deal of opposition, both in the House of Commons and the House of Lords.

1505. That is the Bill under which the Metropolis Roads Commission was constituted?—Yes, that is the first Act in 1827; and there was a second Act of the 10th of George the Fourth, chapter 30.

1506. You have been the chairman of the Commission, have you not, since its commencement?—Yes.

1507. The Commission was appointed, I believe, in this way; it consisted of a certain number of individuals who were supposed to be conversant with public works of that nature, and a certain amount of representation by having metropolitan Members put upon it?—Yes; there were various persons; most of the active men of business in Parliament at the time, Sir Henry Parnell and Mr. Hume; and then for the local members of the Board there was a selection from the chief brewers and brickmakers, and persons who had been active in the

Right Hon. *Earl of Lonsdale.*

30 June 1856.

former trusts; but all those names are recapitulated in the first Act of Parliament.

1508. The state of the roads at the time, I believe, was this; they were in a miserable state of repair, and in such a state of debt, that it was absolutely necessary, in order to preserve in good order the most important thoroughfares in London, that some measure of this sort should be passed?—Yes; there were complaints at that period, chiefly from the proprietors of coaches and others, that it killed their horses; in short, the roads were at that period almost entirely mended with gravel, a certain portion with flint; I think there was but a mile of stone road in the whole district.

1509. The debt which they had contracted at that time was about 150,000*l.*, including the bond debt; since that time those roads which were then in so bad a state have been put into complete repair?—That is so.

1510. About 60,000*l.* have been spent upon improvements and upon the roads?—Yes.

1511. The debt is now entirely paid off, and the surplus above all claims in the hands of the Commission is 5,000*l.*; that has been given in evidence, and is, I believe, consistent with your Lordship's knowledge?—It is more than that, we have 10,000*l.* in Exchequer bonds; the balance is a little more, I believe, somewhere about 8,000*l.*, striking a very accurate balance, and diminishing the balance of all the former years as compared with this; besides, I dare say you have read over the amount of improvements, which was 60,000*l.*, which was chiefly in new roads, and for the substantial benefit of the roads; there has been a great deal more done, and paid out of repairs, such as drainage; for the first year or two, I devoted my attention almost entirely to the drainage of the roads, which gave them a solid bottom, and in every part of the roads I began deep draining at that time, particularly about Holloway; there was a controversy with Mr. Telford, who underpaved the road, and put the metal at the top. I thought it could be arrived at in a much cheaper and more simple way in having them well drained in particular places with deep cuts; we had not the advantage then of pipes, they were all brick drains about Holloway and elsewhere; but I believe it has completely answered its purpose, and there is not a part of the metropolis roads, except by the chance of a drain being stopped up, where there is a pool of water remains.

1512. It was stated by a witness before the Committee last year on Metropolitan Communications, that your Lordship had not only given very assiduous attention to all the meetings of this Commission, but that you had yourself been over the roads in order to acquaint yourself with the nature of them, and to consider what would be necessary; is that true?—Yes, that was at a time when I had nothing to do; it was amusement to me to go and inspect.

1513. Did you receive a salary as chairman of that Commission?—None; I had a great deal of trouble, but I got into it, and I did not wish to neglect any public duty which I had once undertaken; there is not a day in the year hardly, when I am in London, that I do not have some communication, or see some one on the business of the Commission; therefore it is a perpetual drain upon my time, which would be better employed other ways.

1514. Then I may congratulate the Commission and the officers under your Lordship's auspices on having entirely carried out the object for which the Commission was constituted. I am now about to call your Lordship's attention to some passages in the reports; perhaps it is a somewhat tedious question, but if your Lordship will lend me your attention, I shall feel obliged. I find in the 6th page of the first report the following sentences: "A great public inconvenience also arises from numerous turnpike gates being stationed in the very streets of the metropolis; the districts of Old-street, Marylebone, and some others in which gates of this class are placed, were formerly roads in the neighbourhood of the metropolis; but in consequence of the extensive range of houses built within these few years in those directions, such roads have become streets, and now form part of the town itself; the Commissioners therefore are inclined to be of opinion that all the gates so situated should be removed, and that these streets, like others in the metropolis, should be upheld and repaired at the charge of the respective parishes; they are fortified in this opinion by what has taken place in the Shoreditch and Bethnal Green roads, the gates and tolls on which (with the consent of the trustees previously obtained)

Right Hon. *Earl of Lonsdale.*

30 June 1856.

obtained) were abolished by the Metropolis Roads Act, and these roads are now managed without gates or other interruptions like the adjoining streets of the district." In the second report, at page 4, I find the following sentences: "The Commissioners also intend to submit to the consideration of Parliament the expediency of relieving the public from a considerable number of turnpike gates which, as before reported, are placed in the very streets of the metropolis. It seems advisable that these new streets should be placed, like the old ones, under the management of the respective parishes." In the third report I find it stated in the first page: "The next object with respect to which the Commissioners expressed their intentions was the removal of turnpike gates from the streets of the metropolis; they have always had this important design in view, but during the past year they have been able to effect the removal of no more than one gate, situate in Albany-street, which street was surrendered to the Commissioners for paving Regent-street on the 1st of January last by virtue of an Act of Parliament repealing a portion of the Metropolis Road Act relative to that street, when the turnpike was removed. This removal is understood to have given great satisfaction to the inhabitants, notwithstanding that by the abolition of a turnpike a rate has been thrown upon them to defray the expense of maintaining the street. A much more extensive improvement of this kind, and which was one of the principal objects the Commissioners had in view at the commencement of their labours, is about to be submitted to Parliament, namely, the removal of turnpikes from certain streets in the metropolis, extending over a space of between eight and nine miles, and the placing of those streets, like others, under the care of the respective parishes through which they pass. The details of this plan will be found in the Report of the Committee appointed to consider the subject with a view to its submission to Parliament, a copy of which will be found in the Appendix." On turning to the Appendix of that Report I find this statement: "Your Committee having taken into their consideration the objects to be embraced by the Bill intended to be submitted to Parliament in conformity with the minute of this Board, proceeded to form an arrangement, in the first place, for the relinquishment of certain portions of road to the several parishes through which they pass." It then goes on to state that sufficient information has been procured respecting the rentals of the several parishes to be affected by this proposed measure, to enable the Commissioners to judge of the expense to which the respective householders would be put by the proposed alteration. The same circumstances which have caused the alteration in the value of the rentals, have rendered it inexpedient that toll-gates should exist in those places which, from being road, when the gates were established, have now become streets, and regularly built on each side. It is unnecessary to dwell upon the extreme inconvenience of toll-gates in the streets of the metropolis, both from the interruption they unavoidably occasion, and the frequent fraud and extortion which, in the hurry of a metropolitan passage, it is almost impossible to prevent; and one of the prominent objects with the promoters of the Consolidation Act, under which this Commission sits, was to remove the serious nuisance of those toll-gates. It has therefore received the earliest attention which it was in the power of the Commissioners to apply to it; their exertions having been hitherto devoted to the clearing off of pecuniary incumbrances which affected the roads when they came into their hands. In the following report, the fourth report, I observe it is stated that, "in the accomplishment of this, as of every general measure of improvement, individual cases have occurred in which hardship has been felt, although the measure, taking all persons affected by it into account, has been productive of general benefit. There are some whose local situations or peculiar avocations cause the tolls to fall more heavily on them than formerly; but while the Commissioners regret that any should suffer inconvenience from what they have adopted for the general good, yet they feel satisfied that as the public is upon the whole benefited, they best discharge their duty in adopting a system of uniformity in the rate of toll. The arrangement for removing turnpike gates from the streets on the northern verge of the metropolis was also carried into effect on the 1st of January last. In the Report of the Committee appointed to consider this subject, previously to submitting it to Parliament (a copy of which was given in the Appendix to the last general Report), the details of this alteration were fully entered into. The Commissioners

Right Hon. *Earl of Lonsdale.*

30 June 1856.

sioners have therefore only now to state, that the streets therein-mentioned no longer form a part of the roads under their management; they are now under the care of the different parishes through which they pass, and the Commissioners have to congratulate the public on those crowded thoroughfares being freed from the inconvenience and obstruction of turnpike gates." The question that I wish to ask your Lordship (having read those passages) is whether any circumstances arose to induce the Commisioners to modify their opinion with regard to the desirableness of removing turnpikes, and gradually taking the gates further from the centre of the metropolis, and throwing certain portions of the roads nearest to the metropolis upon the parishes; because I observe it is here stated, that it was considered by the Commissioners up to that period that such was one of the principal objects for which the Commission was formed. My reason for asking that question is that in the reports subsequent to the latter of these, which is dated 1830, I do not find any trace of the sentiments which I find in the reports which I have wearied your Lordship by reading; and moreover, although indeed one might almost infer the contrary, I find in the year 1845, when Chelsea took upon itself its own roads, the Commissioners would not allow the people of Chelsea to take the entire of the roads of that parish, which it seems by their report they desired to do, as they mention the subject in their report, and say they have not found it necessary to oppose Chelsea in all they have done, but that they could not allow them to take the piece beyond the Admiral Keppel, inasmuch as the boundary line between the parishes of Chelsea and Kensington ran along the road. It appears that the Commissioners did desire to remove, in 1846 and 1847, the turnpike-gates further off from the metropolis; but they then, instead of throwing any portion of the roads that were left upon the parish, still kept the whole of the repairs of the roads upon themselves. I wish to know whether anything occurred subsequently to the year 1831, which induced the Commissioners to change or modify any of the opinions so strongly expressed in the reports I have read to your Lordship?—I think those who have looked into the operations of the Commission, will see that there has been a very extensive removal of gates since 1831; one which has occurred within these few years, which is Queen's Elms Green, on the Fulham-road, which is now removed to Walham Green, and that is the longest course that a person can take out of London; I think it is above two miles. Kensington-gate was at Knightsbridge; it was set back to the end of Kensington Town, and Tyburn was removed early; it first went to Bayswater; then just opposite the gate at Kensington Gardens, and is now at the bottom of Notting Hill; but however every removal after a certain time, has about the same quantum of complaint against it as before. Then Harrow is set back; Kilburn has been set back from Pineapple-gate; that and the others were all within this period of 1831. Many gates have been set back at Pancras.

1515. The object of my question was to ask your Lordship how it happened that while up to the year 1831, whenever those gates were removed, certain portions of the trust road were thrown upon the parishes, that plan was never pursued after the year 1831?—The parishes refused to take them; because in the year 1830 we had a Bill, and we proposed, as we had removed Old-street gate and the St. Leonard's and other gates that were in the town in that district, to remove the City-road gate, which is one of the most obnoxious ones, but it was lost in Parliament. I recollect Mr. Maberly and some other gentlemen said it would be too hard upon so poor a parish as St. Luke's to bear a portion of the City-road, and it was rejected.

1516. There is in this Appendix, as you will see, a schedule mentioning the names of the parishes through which portions of the roads went, which it was proposed to throw upon the parishes?—Yes.

1517. I presume all those portions of roads were thrown upon the parishes that are mentioned, except the parish of St. Luke's?—All of them, I believe, except St. Luke's.

1518. I want to know, considering that Parliament had given leave to the Commissioners to throw those roads upon the parishes, thereby, of course, leaving less expense upon the Commissioners, and enabling them to remove still further gates, how it is that subsequently to that time no attempt has been made upon the part of the Commissioners to remove them further?—The gates have been removed

removed a great deal further from this period upon almost every trust, particularly at the west end of the town.

1519. I am quite aware that gates have been removed; but I want to know why no attempt was made to bring in a Bill similar to that of 1830, with a view to lessening the expense upon the Commission by throwing the roads upon the parishes, and so enabling the Commissioners to remove the gates further?—Parliament gave us a broad hint in throwing out St. Luke's. I have no doubt St. Margaret's, which would have been perhaps a still harder case, and some others, would have met with the same fate, because the great difficulty in all these cases of parishes where the road is at the extremity of the parish, and where the parish use very little of it, is that they would have the full expense placed upon them.

1520. Then am I to understand your Lordship that it was on account of Parliament refusing, in the case of St. Luke's, to throw that six furlongs upon St. Luke's, although it passed all the others, that the Commission never afterwards contemplated pursuing the same course?—Yes, principally on that account.

1521. If you refer to the Act you will see that a rate of no less than 2½*d.* in the pound was imposed on Clerkenwell by the same Bill?—That is very true, but Clerkenwell did not object; if they had probably any friend a Member of Parliament, they might have appealed against it with success; but, however, it happened that it came to a vote in the Committee upon the Bill, and St. Luke's was rejected.

1522. The rate upon St. Luke's was only a three-farthings rate I see?—Yes.

1523. I observe that in no one of the Reports is such a project mentioned after 1830, although it is mentioned in every Report up to 1830?—We had some means of ascertaining the feeling upon the subject; and up to the present day, when your Lordship moved for this Committee, there has been no move on the part of any Member of Parliament for the purpose, and in all the vestries, which are composed of the leading people of the different parishes, whenever it has been submitted to them, or talked about, it has been unanimously rejected. We have recently, both at Hackney and at Islington, had instances of that.

1524. Was that Act a very expensive Act?—No; there were no witnesses from the country or anything else; it was nearly as cheap as an Act could be.

1525. Then I am to understand your Lordship, that the circumstance of Parliament having refused to impose a three-farthing rate upon St. Luke's, combined with the general unwillingness of the parishes to undertake the roads, has been the reason why the Commissioners, having up to that point always maintained the propriety of throwing those roads upon the parishes, subsequently never considered the matter further, or at all events did not bring it forward?—We waited, that something might occur; districts might be built over, or there might be the same reasons that still exist. Parishes are increasing in building and in wealth, so that Parliament might not find the same objection to it hereafter as they have done for past years.

1526. The result, as we are informed, is, that at the present moment there are between 11 and 12 miles of road within the gates that are maintained by the Commissioners at a cost of no less than 15,000*l.*?—Somewhere about that.

1527. And it would seem further that those parishes have some of them been freed almost entirely from toll, and as far as the inhabitants of those parishes going about within them are concerned, they have a piece of road kept for them for which they pay nothing?—Yes.

1528. Does your Lordship think it would be possible to go on removing the turnpikes, and still maintaining all the roads which are within the metropolis; or would it be possible to proceed much further in that direction?—No; you are in the position now that you have arrived at the time when you cannot give any more; you may perhaps afford some little local accommodation within those circles.

1529. But had the system continued which was adopted in 1830, you would have gone on pursuing the same process; the moment a toll-gate was really found to be in a street you would have gone on removing that toll-gate and throwing the expense upon the parish?—We could not have done much more than we have done until the debt was paid off.

1530. But in 1830 very little debt was paid off?—No, but I think those

Right Hon. *Earl of Lonsdale.*

30 June 1856.

trusts which were thrown upon the parishes had no debt, or next to no debt; Marylebone, I think, had no debt upon it.

1531. The original Act consolidated a certain district; that was for the purpose, I presume, not of making the tolls on each separate road pay for the maintenance of that road, and pay off its own debt simply, but that the amount collected for the toll over the whole district was to pay the debt of the whole and maintain the whole?—Yes, that was the principle, with the exceptions of Harrow and Kilburn, which had an estate; and in the Act there is a clause that a separate account should be kept of those two roads to be presented to the Governors of Harrow School; and looking eventually to that estate paying for the roads, which, as to Harrow, I think it is very likely it will very shortly.

1532. So that there is no question of there being more or less debt upon any particular district with reference to the way in which you would treat it now?—No.

1533. It has been considered by the Commission, with the exception your Lordship mentioned, as a whole?—It has always been considered as a whole.

1534. Your Lordship, I think, has stated that at the present moment you cannot do much in the way of removing the gates further, so long as the parishes refuse to take the roads?—If you threw the gates back another half or three quarters of a mile, you would cause a diminution of the revenue to the amount of from 15,000*l.* to 17,000*l.* a year.

1535. There is no other way of removing them except by throwing upon those roads that are totally free from toll-bars the other roads?—There is no other way that occurs to me.

1536. Have you ever considered any other method, such as having a general highway rate for the whole of the metropolis?—In whatever way it is done, I think it would give inequality. If there were a general highway rate those who were at the extreme of the county would be charged to maintain a road of which they made very little use; it is one of those things as to which the best and most reasonable view at first is, that those who use the road should pay for it; but when it comes to a general tax it involves inequality somewhere; the inequality is so great in this particular case that it is very difficult to handle.

1537. Of course, if that were carried out, the principle would go to putting up gates in the Strand, Piccadilly, and other places?—Yes.

1538. Your Lordship is very well acquainted with the practice as to turnpike roads elsewhere than in the metropolis, are you not?—Yes.

1539. Is it not the universal practice where a town enlarges itself, take, for instance, Leeds, Birmingham, and Manchester, or any of those towns, that whenever the trustees come for a renewal of their Act, the part within the town is almost without exception taken away from the trust, and thrown upon the parishes in which it exists?—Lord Shaftesbury, when he was Chairman of Committees, had a general rule always to take the streets out of the Act of Parliament; he would not renew an Act with a street in it.

1540. I believe it is within your knowledge that that has been almost the universal practice for many years?—Yes; in Edinburgh there is a different principle; there was a Consolidation Act there, when they moved back the gates, and the Act had a clause in it that all the houses between the gate and the city should pay a rate also.

1541. Still as far as England goes, that is in fact the system?—Yes.

1542. Does your Lordship see any reason why the metropolis should be exempted from that custom?—I do not know of any; there are not above two or three gates in the metropolis now, as you may say; the gates have been latterly built about, but there are very few gates in the streets; certainly none in the metropolis, without you call the City-road in the metropolis one; the others have been built about of late no doubt.

1543. Are there not several gates which are in point of fact in the middle of streets; that is to say, they have houses on both sides of the gates for a considerable distance on both sides of the road?—Not in the metropolis.

1544. The City-road, I think you say?—Yes, and there is Nottinghill.

1545. The Angel at Islington?—Yes.

1546. Old St. Pancras-road?—Yes, that has been built out lately.

1547. Nottinghill you mentioned?—Nottinghill has got buildings about it.

1548. As

1548. As to the gate at one of the entrances into Kensington, although the road is not built upon on both sides, it is only in the same situation as Piccadilly is, inasmuch as there are on one side houses, and on the other side park?—There is a great distinction between that and London, I think.

1549. I think at the same time, the parish of St. George's, Hanover-square, is notwithstanding compelled to repair Piccadilly?—We used to pay them; we paid them 20,000 *l.* to take it. One of our debts was paying St. George's, Hanover-square, 1,000 *l.* a year, and that is included in our debts, and we bought the annuities somewhere about 19,000 *l.*

1550. I presume they had some debt upon that road?—That was one.

1551. That was not a compensation, I presume, for taking the road, it was some debt that remained upon the road?—Under a former Act of Parliament the turnpike, I believe, repaired a portion of Piccadilly. Another Act of Parliament, if I recollect, but I will not be positive, the Kensington Act, they agreed to pay them 1,000 *l.* a year, to undertake the road upon Piccadilly, which we inherited as a debt, and they took 19,000 *l.* I think for it; that was one of our debts.

1552. Does your Lordship see any particular reason why the parishes of St. George's, Hanover-square, St. James's, and St. Martin's, should repair such thoroughfares as Piccadilly, part of Oxford-street, and part of Regent-street, and the wealthy parishes of Paddington, Marylebone, and St. Pancras should not repair the whole of their roads?—I do not think the cases are quite analogous. I should have no objection to it; but I do not think the cases you put are quite analogous. Though there may be a regular frontage of houses such as you say at Kensington, if you go back there 50 yards, there is no town existing, whereas it is all town in St. Martin's; every yard of it is built over.

1553. Is not the whole of that part of Paddington and Marylebone in which no turnpikes exist in the same condition?—Your observations referred to Kensington.

1554. I asked whether you saw any reason why the parishes of St. George's, Hanover-square, St. James's, and St. Martin's, should repair the great thoroughfares which go through them, and that the wealthy parishes of Paddington, Marylebone, and St. Pancras should not also take upon them the burden of the turnpike roads which pass through them?—It is a hypothetical case; there is no reason why they should not do it if they agree to it; but in this case of rural districts the difference has been this; where it is a through traffic, and a long traffic, the parishes have acted upon the principle that they should get a Turnpike Bill, as a matter of practice. In a town where rates, I suppose, are more easily collected, from the number of course it is less burdensome. I have heard in some parishes where buildings have increased, I believe in St. George's, on account of Belgrave-square, and elsewhere, that the rates are now less than they were formerly.

1555. Is it not your Lordship's opinion that when parishes have become so large and so opulent as to allow the rating to be spread over a very large ratable area, there is no reason why one parish should have to maintain thoroughfares, which, of course, as they approach the centre of the metropolis, will become more and more expensive?—I do not know. It is difficult to form an opinion upon any general proposition of that sort. I think the opinion is more properly to be taken upon a particular locality.

1556. Take the parish of Marylebone as contrasted with St. George's, Hanover-square: neither is entirely built over; one has to repair Piccadilly, and Park-lane; the other has to repair a district equally large; but Marylebone is receiving, I think, repairs out of the general fund of the metropolis trust, together with a part of the trust money?—That may be a little bit in Marylebone, at Maida Hill, somewhere about there.

1557. Take another parish; there is St. Pancras, which has got seven miles of road through it; that has a ratable property of 800,000 *l.*; there does not seem to be any more reason why St. Pancras should not maintain their roads as well as St. George's, Hanover-square?—If St. Pancras is willing, I am not disposed to throw any obstacle in the way.

1558. Does your Lordship think the parishes ought to be consulted before any Bill is brought into Parliament for the purpose of throwing those portions of the roads upon their rates?—They have their weight. I do not say they should be consulted.

Right Hon. *Earl of Lonsdale.*

30 June 1856.

1559. Did the Commission consult those parishes in 1830, previous to bringing in the Bills?—I do not know that they consulted them, but they obtained information whether they were likely to agree to it or not; but it has so long gone by that I do not know how that was.

1560. But can your Lordship recollect whether they really did consent to it?—Marylebone consented, I think, at the time; I will not be sure.

1561. I understand your Lordship to say that you do not see really any means now of any of those toll-gates at present existing, except to a very small degree, being removed, unless the roads are thrown upon the parishes, some part of the roads at least?—I do not see from what fund they can be repaired, except by the parishes, because the further we put the gates back, the greater the loss will be of revenue; if we advance them, there will be the same increase; if we brought them forward half a mile, there would then be 15,000*l.* or 16,000*l.* a year more revenue; if we put them back half a mile, we lose about the same amount.

1562. I observe that the revenue is very elastic which is derived from the tolls, for I see that in 1830, after the removal of those gates which were removed by the Act of 1830, although the area of taxation was much smaller, yet the tolls did not fall off?—No; there were no railways at that time.

1563. Still the result was, that in the two following years the tolls produced more than they did at that time?—Yes.

1564. I also observe that if those portions of the roads were to be thrown upon the parishes which go through St. George's, Hanover-square, Paddington, Marylebone, St. Pancras, Clerkenwell, St. Leonard's, and Bethnal Green, the expense would not amount in any instance to as much as 1¾*d.*, or, in one instance, only to 1¾*d.* in the pound; and yet by the Bill of 1830, 2½*d.* in the pound was thrown upon Clerkenwell. There does not at first sight seem any obvious reason why those parishes should not take to their roads as Clerkenwell did to its roads in 1830?—On my own responsibility, knowing them, I would not undertake to propose it to them. If this Committee pass a resolution and order it to be done by the Commissioners, I dare say they would be glad to aid them in it.

1565. I presume that what has been said in these early Reports of the nuisance of toll-bars in populous districts, is still your Lordship's opinion?—Yes, I look upon them as an annoyance; I have no pleasure in approaching a turnpike-gate.

1566. The annoyance is described in very glowing terms in these Reports, and that is still, I presume, the opinion of the Commission?—Yes.

1567. But the doubt whether the parishes would take the roads, or some part of them, or the doubt whether Parliament would agree to the proposal, has prevented the Commissioners going any further in that direction?—Yes, for the present; at all events until new circumstances arise.

1568. Sir *William Jolliffe.*] Of course it would be necessary that an Act of Parliament should be brought in to throw any part of those roads upon the parishes?—I do not know; I suppose so; but I assume that we could be called upon by a mandamus or something of that kind to know if we had funds to repair them; if we had no funds I suppose they would fall upon the common law liability of statute labour on the parishes.

1569. In fact the Commission could not be relieved from the repair of those roads except by enactment?—No.

1570. After the Bill that was brought in, by which the 11 miles of road was thrown upon the parishes, it became evident to the Commissioners that a very considerable opposition would take place by the parishes if Bills were offered to be brought in to cast more of the roads upon those parishes?—We assumed so from the information we got, but I do not think, except in one or two instances, we had any direct communication with the parishes.

1571. From the mode in which Parliament had entertained the opposition, probably your Lordship was doubtful whether the Bill might be successful or not?—I doubted its success at all; I knew Parliament at that time much better than I do now.

1572. You have been asked whether you considered all the districts with the exception of two, which were entitled to certain property, which had been bequeathed for the purpose of repairs, were, as far as the payment of debts and the general maintenance were concerned, one district?—Certainly.

1573. The

1573. The toll collected at any gate in any parish is by no means a local tax or a parochial tax, and cannot be so considered?—It is contributed to in various ways; there is what is called the through traffic and there is the local traffic.

1574. The through traffic, of course, would not belong to the parish?—Certainly not; the local traffic in most cases is very small as compared with the general traffic.

1575. And therefore the great bulk of the taxation would fall upon the owners, or those who lived within the district?—Yes.

1576. If any general tax, or any general rate were levied throughout the metropolis for the purpose of maintaining those roads, do not you think it would be a great hardship upon parishes like St. Martin's, St. James's, and St. George's that they should contribute to that general tax?—There is no doubt of that: they rarely use the roads.

1577. And they maintain the whole of the other roads within their respective parishes?—Yes.

1578. I think when the original Act was passed in 1826, several districts were abolished altogether, were they not?—Two or three small ones; Old-street, Bethnal Green, and Shoreditch.

1579. Were the roads of those trusts thrown upon the parishes, or did they become part of the metropolis roads?—They were thrown upon the parishes; certainly Old-street was.

1580. By the first Act of 1826 were the old rates and tolls upon all the different trusts continued, by the Consolidation Act?—Some; we tried to assimilate them as far as we could, but there were some exceptions; the City-road was only at 1 *d.*; that had been for a long time; Hackney, which was a short run for a public carriage, was 1½ *d.* a horse, and also at Lee Bridge it was 1½ *d.*; there were three or four exceptions to that; but I believe ours is the lowest scale of tolls now anywhere; at least I observe at the Commercial-road and at Highgate Archway it is 4 *d.* for a single horse drawing; we have never taken more than 3 *d.*, and the Hackney 1½ *d.*, and Lee Bridge 1½ *d.*, and the City Road 1 *d.*

1581. The toll was rendered uniform, I think, throughout the whole district by the Act of 1829?—Very nearly. I mention those exceptions.

1582. But that was after 1826?—Yes.

1583. In the first Act of 1826, I asked your Lordship whether that was so?—No, we took the old scale to facilitate its passing through Parliament; that was the arrangement entered into by the first Act; it was merely an Act of consolidation.

1584. Under the Consolidation Act there was a very great variety of tolls?—Yes, every trust had a different scale of toll.

1585. I think we have before us what the total income was in 1831 and 1832?—Yes; but I can give it you.

1586. Your Lordship has stated that if the present gates were put back half a mile, or three-quarters of a mile, you would contemplate a loss of income to the amount of something like 17,000 *l.* a year?—From 15,000 *l.* to 17,000 *l.*

1587. Have you ever made any computation, or have any of the officers of the Commission made any computation of what would be the amount of tolls, supposing the toll-gates resumed their former positions?—I think there would be an increase in about the same proportion, 15,000 *l.* or 16,000 *l.* a year.

1588. Is that calculation made upon the present traffic?—Upon the present traffic.

1589. What effect has the omnibus traffic upon the wear of the roads within the district?—I should say the omnibus is the hardest wear of any traffic that we have; there are great weights going upon narrow wheels. Suppose that the omnibuses take on the average, when they are loaded, between two and three tons, they run upon very narrow wheels, and go fast. We have two descriptions of traffic now which is very wearing to our roads; first, the omnibuses, which I have described; then the railroad vans, which I believe carry between four and five tons, and they all run now upon a trot, but they have rather wider wheels than the omnibuses; they have about a three-inch wheel; and all waggons going under a 4½-inch wheel pay an additional toll; our scale in the metropolis roads is, for carts drawing under a 4½-inch wheel, half a toll in addition.

Right Hon. *Earl of Lonsdale.*

30 June 1856.

1590. That description of traffic has very much increased recently, has it not; the railway van traffic?—Yes; they go at a trot, and if they had flint and gravel roads they could not trot in winter; the roads would be soaked and soft.

1591. Mr. *Hildyard.*] You stated that the Commissioners had no reason to believe that the toll-gates are an unequal mode of raising money for the repair of those roads, so far as the mass of the community is concerned?—I should suppose not; I draw that inference from all the parishes being either silent, or opposing the removal of the gates.

1592. In fact, have you not reason to believe that the main hostility to these gates arises from a limited number of parties, the owners of omnibuses, for instance, and particular tradesmen whose carts pass along the roads, butchers, and so on, and the railway traffic, who may contribute largely to the tolls?—That is one objection, but it is also general; the smallest amount of the four divisions of traffic, you may say, is the pleasure traffic. All gentlemen who go on horseback or in carriages cry out against the Kensington-gate, because there is a greater proportion of pleasure traffic at Kensington than there is at other places, so that you hear people that travel in their carriages or on horseback make an outcry as to Kensington. It is only recent as to the omnibuses. Some years back the omnibus proprietors have applied to us by letter to get stone roads; I have a letter here, but unfortunately some of the letters have gone with Sir James Macadam's papers. He had constant communication with the omnibus people, but they did not complain, however at that time; all they solicited was to get a hard stone road instead of the gravel, which destroyed their horses.

1593. I think you told us that when you first commenced there was about one mile of granite stone road?—Yes.

1594. How many miles have you now?—About 50.

1595. In addition to the weight of the omnibuses when loaded, and the narrowness of the wheels, is not the omnibus traffic very wearing to the roads from the circumstance of its constantly stopping to take up, and so on?—It is to a certain degree; there is the tear of the road by the horses in straining to get into action.

1596. Is this the letter to which you allude: "To the honourable the Commissioners of Metropolis Roads—Gentlemen, Having on a previous occasion applied to your Honourable Board for an extension of granite in lieu of flints, you were then pleased to give our deputation the most polite and considerate attention to that subject, which has been most satisfactory to us, on your portion of the Hampstead and Highgate districts of metropolis roads, and which has been carried into effect in a most prompt and satisfactory manner; and we are now as proprietors of public conveyances enjoying the benefit from a sound granite road as far as Hampstead, and also to Kentish Town turnpike-gate. We again beg leave to petition that your Honourable Board may grant a further extension of granite road where our traffic is daily increasing, namely, from Kentish Town gate, where previously done with flint, to the bottom of Highgate-hill, and from Camden Road Bridge to the junction of Holloway-road; those portions of road are now so frequently coated with flints, and the friction so great, our progress in travelling thereby much impeded to that of a granite road, will, we trust, be a sufficient reason for us again calling upon you to coat those roads with granite in lieu of flints. We, the omnibus proprietors of Hampstead, Highgate, Kentish and Camden Town, beg leave, gentlemen, to subscribe ourselves your most obedient humble servants, Alex. Hamilton, G. R. Sexton, J. H. Bardell, J. Watkins, T. Tipping, P. Symes, Henry Gray, Henry Woolley, Philip Willing, S. Hawkins, J. Willing. Camden Town, 27th February 1850?"—That is the letter.

1597. Has there been any further extension of granite since that period?—Yes.

1598. Meeting the views of those gentlemen?—Yes; we had another in 1854, asking for the Shepherd's Bush road to be coated with granite.

1599. A similar request in 1854 for the Shepherd's Bush road?—Yes.

[*The same was delivered in, and is as follows:*]

Gentlemen,

Right Hon. *Earl of Lonsdale.*

30 June 1856.

Trafalgar Cottage, Hammersmith,
4 January 1854.

Gentlemen,

I AM directed by the committee of the Hammersmith Improvement Association to call your attention to the third resolution in the enclosed circular, and respectfully to solicit your consideration of the subject referred to therein.

I am, Gentlemen, your obedient servant,
(signed) *P. H. Nicolas.*

To the Commissioners of the
Metropolitan Roads, 2, Whitehall-place.

Hammersmith Parochial Improvement Association, New-road District.

AN association having been formed for the purpose embodied in the following resolutions, passed at a meeting held at the Lake Tavern, on Wednesday, the 21st December 1853, Mr. Peter Broad in the chair, a public meeting of the inhabitants of the neighbourhood will be held at the Lake Tavern, on Monday, the 9th of January 1854, to determine the most effectual means of carrying the proposed measure into execution.

1st. That the primary object of this association be the local improvement of the neighbourhood, and to render all possible aid in carrying out all general measures for the welfare of the parish at large.

2d. That the special attention of this association be directed to the formation of a new district, for the purpose of lighting, or to the addition of other parts of this locality not already included in the present district.

3d. That this association open a correspondence with the Commissioners of Roads, for the purpose of inducing them to repave the New-road with granite, as adopted in the main thoroughfares, instead of with flint; which measure is rendered necessary to meet the greatly-increased traffic upon it.

4th. That this association view with satisfaction the improvement now adopted in the repair of a great portion of the parish highways with granite, as tending ultimately to diminish the cost of maintenance; but that the attention of the Board of Surveyors be called to the present unsatisfactory condition of the pathways in the neighbourhood not paved, and that a communication to the Board of Surveyors be immediately made on the subject.

5th. That it is essential that the neighbourhood shall be duly represented by resident gentlemen at the Parochial Board of Surveyors, and the inhabitants be called upon at the next election strenuously to assist in procuring their election.

P. H. Nicolas, Honorary Secretary.

1600. Is that particular road which they advert to paved with granite?—No, it is a recent matter in 1855; we have not had leisure to do that yet.

1601. I imagine the omnibus proprietors are very much interested in the state of the road, so far as the wear and tear of their horses is concerned?—I should think so, more than any one else, and that they would feel the effects of a bad road more than any person. In winter I look upon it that it is destruction to the horses to have bad roads.

1602. It has been given in evidence before this Committee that the whole of the omnibus traffic of this metropolis is now in the hands of two separate parties; I may call them, one the General Omnibus Company, and the other a number of omnibus proprietors running upon a particular line, and that those are the only two distinct interests which exist; what, in your Lordship's opinion, would be the effect of doing away with these tolls, so far as the interests of the public and the interests of the omnibus proprietors are concerned, under such circumstances?—I cannot tell you; it would be a certain boon to them, supposing the roads were kept up in a good and fit state.

1603. Supposing they did not lose in the deteriorated condition of the roads, would they not, by putting the tolls into their pockets, be gainers?—They would be working at a cheaper rate.

1604. Can your Lordship tell us what was the cost of the establishment of the aggregate trusts out of which your Commission was formed?—It is mentioned in the First Report; I think 4,800*l.* or 4,900*l.* a year.

1605. What is the cost of your Commission now?—I think it is under 3,000*l.* now; but I beg to observe that that may be an exception. It has been established now going on for 30 years, and we can say that which I believe no other office can say, that the expense of our establishment has not increased at all during that time.

1606. There has been no increase upon it since it was originally established?—No, and it works most efficiently. I do not think, if the Committee choose to examine into it, they will find any office in better condition; every paper is kept correctly; there are no arrears of business of any kind. I have held a

Right Hon. *Earl of Lonsdale.*

30 June 1856.

great variety of offices, and I say that that office is a model for all others to follow.

1607. It is, I believe, in your Lordship's opinion, an exception to the rule that unpaid Commissions have never worked cheaply?—Yes.

1608. With respect to the mode in which you supply yourselves with the articles that are required, the material, for instance, of granite, is that done by public tender?—Yes; our course of business is this: our annual meeting is in March, when we make a report. Previous to that time the surveyor (because we all go by estimates) makes a general survey of the roads, and prepares his estimate of what the roads will require, or what improvements he would suggest; and he submits that estimate to the Commissioners, and the Commissioners sanction or alter it as the case may be; that being done, he issues a public advertisement for the requirements of stone or cart labour, and all the variety of work that we have, and a fixed day is named for those people to send in their tenders. We have a box in the office, and the rule is that at such an hour of such a day all those tenders must be put into that box, for we had previously great disputes as to whether some were in time or not, and one dispute or another, we suspecting that they had got in the meantime the prices which other people had tendered at; so that we had a box put there, which is opened after a certain hour by the secretary; the tenders are forwarded to me or brought before the finance committee, and they are opened, and the initials of myself, or the Commissioner who opens them, are put to them, and then in the interval of another meeting they are all registered, and then they come before the Board. They generally come before the Board rather for form's sake; they are usually referred to me to pick out the cheapest, taking care at the same time to have responsible men. Here is a scale relating to the last time we advertised for materials; that is an abstract of it (*handing in the same*).

1609. Is it the practice of the Commissioners, where they can safely do it, to take the lowest tender?—Almost in all cases. There have been one or two people, but that has very rarely occurred, whom we have rejected for not having fulfilled the previous contract; but I do not think there have been three cases these five years.

1610. Where therefore a party has not been a previous defaulter in a contract, you take the lowest tender?—Always.

1611. We have heard it stated that the price of granite in Chelsea parish is 12*s.* 6*d.* a ton, as contrasted with the 14*s.* 2*d.* of the Metropolitan Trust. I wish to ask your Lordship, do you buy your granite by the ton or by the cubic yard?—By the cubic yard.

1612. Invariably?—Invariably, as you will see in that paper; it is always by the yard.

1613. Can you tell me how many cwt. there are in a cubic yard of granite?—About 25 cwt.

1614. Therefore if the Chelsea parish pays 12*s.* 6*d.* a ton, we must add to that one-fourth more to get at what it is costing the parish per cubic yard?—Yes.

1615. If you take one-fourth of that, it will make 15*s.* 7½*d.* as the cost of a cubic yard to Chelsea parish?—Yes.

1616. What is the average cost to the Commissioners of a cubic yard of granite broken?—It varies in different places.

1617. But at the same place as that at which Chelsea would take it, where they bought it delivered to them?—At Chelsea Dock 14*s.* 4*d.*

1618. That is broken?—It is broken.

1619. As compared with 15*s.* 7½*d.* paid by the parish of Chelsea. It is in evidence that the parish of Chelsea break the granite by their paupers, and that they estimate the cost of breaking them by pauper labour to be, I think, 2*s.* 1*d.* Do you know what it costs the Commissioners to break the granite?—We buy it broken now; but it was from 2*s.* 6*d.* to 3*s.*; nearer 3*s.*; the sum varies.

1620. I think your Lordship has already stated to us, that a considerable portion of what is charged under the head of repairs in the trust, does practically amount to improvements made?—There have been certain portions annually, such as paved channels, defining the road, draining, and other things, which perhaps in other cases might be put to capital account; but we have always kept a certain quantity of that under the head of repairs.

1621. I imagine

1621. I imagine that during the last two or three years, in fact since the commencement of the war, the high price of everything must have increased the expenditure and the cost of all roads?—There has been both an increase in materials and an increase in labour, and an increase in cartage; every heading has increased; every service has increased in price from 7½ per cent. to more than that.

1622. Therefore, assuming that we are to get back to the old prices again, there may possibly be a reduction in the expenditure of the trust, and so far a surplus resulting from the other things remaining the same?—Our contract work, there is no doubt, we shall get cheaper.

1623. With respect to the principle that was adverted to in the three Reports that were made, I understood your Lordship to say that you have acted upon it to a very great extent in the removal of the bars, and that now, still agreeing to the principle, you are only prevented from carrying it on by having got to the end of your means?—We are willing to afford all the accommodation that we can, but we cannot go too far without injustice to the parishes further off or near at hand. I should myself, individually, be very glad to seize every opportunity for putting back gates.

1624. I believe it has already been stated in evidence, I dare say your Lordship will confirm it, that there has been no instance of any parish, excepting Chelsea, having applied to have the roads taken off its hands, in which the Commission have refused?—Chelsea is the only case that I recollect.

1625. The Board has given the parishes no reason to believe that if they will make similar applications they will turn a deaf ear to them?—No.

1626. Mr. *Wrightson.*] I observe on looking over the 1830 Report, which you have given us, that there is a very great difference between the toll income in the earlier years and that in the later years?—Yes.

1627. I have been taking the average of the first 10 years of the trust, and I find that the toll income amounted to 77,800 *l.*, and when I take the last 10 years of the trust, the toll income only amounts to 62,000 *l.* a year, being about 15,000 *l.* a year less income than there was in the first 10 years?—Yes.

1628. I conceive that the Commissioners have been shut out latterly from most of the opportunities which they had in the earlier years of doing things in this trust that were for the benefit of the public?—Yes.

1629. Do not you conceive that the public have suffered materially from your having been deprived of this useful power, which you exercised in the earlier years so advantageously, and that it is a matter of regret to the public that the funds of this trust should have fallen off to such a degree as to have deprived it of its power to a very great extent?—No doubt the public have suffered; but I do not exactly understand the construction you put upon "the public."

1630. I mean that if the income had kept up at the rate at which it was at one time, would not the Commission have been able to make so advantageous a distribution of their profits, that we, on the part of the public here, should have been in a much better position than we are now to deal with this question?—We should be satisfied if we could get a fund now. We are in this position: we have an important charge, to keep up the metropolis roads north of the Thames, and they cannot be kept up without income; therefore we must retain the gates, though we have made different concessions in putting them back; we have now got nearly to the end of our tether, and we cannot keep the roads in an efficient state if we put the gates still further back, because we estimate that there would be a loss of another 15,000 *l.* to put them back, you may say half a mile.

1631. Would it not be desirable if some means could be found of improving the income of the Commission to some moderate extent; we will say if the parishes were called upon to contribute in a small degree towards making up the efficient income which you once possessed, would not the Commission be able to carry out the same public improvements in future?—Certainly; if they would consent to what the Edinburgh Bill has, namely, a rate upon the houses between the gates and the town.

1632. I find, by a return made to this Committee, that the rateable property within the district of this Commission is about 6,000,000 *l.* a year, and therefore a hundredth part of that amount (which is about 2½ *d.* in the pound) would raise a sum equal to the whole of the expense you are now subjected to, about 60,000 *l.* a year. Now I ask you how much of that 2½ *d.* in the pound

Right Hon. *Earl of Lonsdale.*

30 June 1856.

it would be reasonable and quite unobjectionable to ask the parishes to contribute in order to supply this fund; would you think that 1 *d.* in the pound would be sufficient?—We can hardly tell; it is a matter of calculation; if you put the gates another half mile further from the town it will cost about 15,000 *l.*; therefore it must be an affair of calculation.

1633. I find that a halfpenny in the pound would raise about 12,000 *l.* over the whole district?—Yes, if you got it all; but perhaps it may be necessary to raise more, because in the little I have had to do with rates I have always found that there has been a great arrear of them.

1634. Would you think that 1 *d.* or 2 *d.* in the pound would be a sum which parishes ought to object to, in reason, for purposes of this kind, in order to accomplish the object gradually and surely?—I cannot say; but if I were a member of a parish, I would willingly pay 1 *d.* in the pound to get rid of gates at the end of the town.

1635. May I ask you whether it would not be more desirable on the whole to adopt some plan of that kind, rather than to throw the roads in each parish upon the individual parishes, subject to all the variations of expense which we find arise from 1½ *d.* in the pound up to 1 *s.* 6 *d.*, for the inequality has been as great as that; whereas by some plan of this kind, the inequality would be altogether removed?—When you come to one general rate you get into great unpopularity upon the other side.

1636. I observe by the Act of Parliament under which your Lordships' Commission was founded, that there was a power given to the Commission to rate the parishes to the extent of 4 *d.* in the pound, for the purposes of lighting and watching and so on; how is that now?—We got rid of the lighting and watching as soon as we could, as it is no part of our duty to watch and light.

1637. Seeing you possessed a power of that description in the original Act, would it not be analogous to that if a power were taken at some future time to come upon the parishes for some moderate contribution of that kind to carry out the object which the Commission had in view for some time at its original formation, which it carried out so well for so many years, and which it is now deprived of the means of going on with from want of funds?—I see no objection.

1638. Sir *John Shelley.*] May I ask whether the parishes ought or not to be ready to submit to this burden; did not I understand you that the parish of Chelsea is the only one that petitioned the Commission upon the subject?—Yes.

1639. Is your Lordship aware that at the time that petition was presented the vestry of the parish of Chelsea was a select vestry?—I am not aware.

1640. Did the memorial come through the vestry to the Commissioners, do you remember?—I cannot remember; I think there was a volunteer from the clerk; he wrote a letter to our Board.

1641. The clerk of the vestry?—The clerk of the vestry.

1642. Your Lordship is not aware whether there was a select vestry or not?—No.

1643. With regard to the tenders for granite, are there many persons who tender for the supply of granite?—A fair number.

1644. Could a list of those who have tendered be put in?—Yes.

1645–6. Will your Lordship be good enough to read the names of those who tendered the last time?—(Mr. *Browse.*) The following are lists of those who tendered in 1856 for granite, flint, gravel, slopping, watering, cartage, and day cartage, distinguishing those who were accepted (*reading the same, as follows:*)

For Stone.

Messrs. Turner & Goodyear	Accepted.
J. Mowlem & Co.	ditto.
A. & G. Maxwell	ditto.
R. J. & J. Fennings	ditto.
J. Newton	ditto.
Richard Jee	ditto.
John Sills, senr.	ditto.
Thomas Tuff	Not accepted.
Thomas Baldwin	ditto.
H. G. Dodd	ditto.

Flints.

Henry Dodd	Accepted.
Robert Forest	Not accepted.
George Smeed	ditto.
Thomas Tuff	Accepted.
Thomas Baldwin	ditto.
Richard Mulcock	Not accepted.

Gravel.

William Buckland	Not accepted.
John Coomes	ditto.

Charles

Gravel—continued.

Charles Eley	Accepted.
Thomas Curnock	Not accepted.
Henry Weatherley	ditto.
W. & J. Studds	ditto.
Thomas Hardy & Son	ditto.
Harriet Curnock	Accepted.
J. & G. Nicholls	ditto.
James Lipscomb	Not accepted.
Messrs. Child & Son	Accepted.
William Walker	ditto.

Slopping.

George Axtors	Not accepted.
J. & G. Nicholls	Accepted.
James Gander	ditto.
Alfred Bird	ditto.
William Buckland	ditto.
William Seward	Not accepted.
Charles Starkey	Accepted.
Hart. Curnock	Not accepted.
Thomas Ferguson	Accepted.
Stephen Peet	ditto.
James Sinnot	Not accepted.
Hy. Perkins	ditto.
Thomas Oldfield	ditto.
James Ansell	Accepted.
J. Summersall	Not accepted.
Henry Dodd	ditto.
James Smith	Accepted.
John Rumball	ditto.
Edward Newman	Accepted.
Rt. Drummond	Not accepted.
Wm. Wicks	ditto.
Thos. Rumbal	ditto.
J. Stock	ditto.
Jas. Wragg	ditto.
Wm. Dexter	ditto.

Day Cartage.

R. Emmerson	Not accepted.
Js. Gander	ditto.
W. Seward	ditto.
J. & G. Nicholls	Accepted.
William M'Nae	Not accepted.
Js. & S. Williams	ditto.
William Buckland	Accepted.
C. Eley	Not accepted.
Hy. Weatherley	Accepted.
Js. Ansell	ditto.
Hy. Perkins	Not accepted.
Wm. Stapleton	ditto.
Wm. Harris	ditto.
Hy. Dodd	ditto.
William Harris, jun.	ditto.
Thos. Huggins	ditto.
John Aley	Accepted.
Js. Harris	Not accepted.
Jno. Rumbal	Accepted.
Stephen Peet	Not accepted.
Wm. Walker	Accepted.
Frs. Wragg	ditto.
Js. Summersall	Not accepted.
Thos. Rumbal	ditto.

Day Cartage—continued.

Js. Sinnot	Accepted.
Wm. Wicks	Not accepted.
Ed. Newman	Accepted.

Watering.

Thos. Ferguson	Not accepted.
J. & G. Nicholl	Accepted.
Cs. Eley	ditto.
Wm. Buckland	ditto.
Rd. Emmerson	ditto.
Hy. Weatherley	ditto.
Wm. Seward	Not accepted.
Wm. M'Nae	ditto.
Wm. Stapleton	Accepted.
J. & S. Williams	Not accepted.
Wm. Harris	ditto.
Stephen Peet	ditto.
Js. Summersall	ditto.
Js. Ansell	Accepted.
Js. Harris	Not accepted.
Jno. Aley	Accepted.
Wm. Kiff	ditto.
Wm. Harris, jun.	Not accepted.
Js. Sinnott	ditto.
Cs. Judkins	Accepted.
Rd. Judkins	Not accepted.
Ed. Newman	ditto.
Thos. Higgins	Accepted.
Frs. Wragg	ditto.
Wm. Wicks	Not accepted.
Benj. Draper	ditto.
Jno. Rumball	Accepted.
Thos. Rumball	ditto.

Cartage.

T. W. Hornsby	Accepted.
James Gander	ditto.
William Seward	Not accepted.
J. & G. Nicholls	Accepted.
Thomas Ferguson	Not accepted.
Wm. M'Nae	Accepted.
James Williams	ditto.
Wm. Buckland	Not accepted.
Charles Eley	Accepted.
Henry Weatherley	ditto.
James Ansell	Not accepted.
Henry Perkins	ditto.
Wm. Stapleton	ditto.
Wm. Harris	ditto.
Henry Dodd	ditto.
W. Harris, junr.	ditto.
Thomas Huggins	Accepted.
John Aley	ditto.
James Harris	ditto.
John Rumbal	ditto.
Stephen Peet	ditto.
William Walker	Not accepted.
Francis Wragg	Accepted.
James Summersall	Not accepted.
Thomas Rumbal	Accepted.
James Sinnott	Not accepted.
William Wicks	ditto.

1647. Colonel *Pennant* (*to the Earl of Lonsdale*).] With reference to a proposal made by a Member of the Committee just now, that there should be a rate levied upon the whole district under the Metropolitan Trust, in aid of the Metropolitan Trust, in order to enable that trust to relieve the portions of those parishes in the most populous districts in which the gates at present exist, would not such a plan as that be unequal and unjust in its operation, inasmuch as the rate would be levied over the whole district, but the relief would be

Right Hon. *Earl of Lonsdale.*

30 June 1856.

principally felt by those inner parishes in which the gates would be removed?—Perhaps that may be in some cases. I hardly quite understand how far the area of taxation would go.

1648. *Chairman.*] The proposition was, that the whole district should be rated through which any portions of the Metropolitan Trust road pass?—What do you mean by the whole district? Assuming the road from Notting-hill goes half a mile, or three quarters of a mile, through Paddington, would you call Paddington the district?

1649. Colonel *Pennant.*] The question was, whether the relief would not be felt principally by such certain parishes, whereas the rate would be levied over the whole?—Yes. Whatever is done there would be an inequality in it, and there would be a great inequality in it.

1650. A question was asked the other day by the Committee of the surveyor of the trust, as to whether it would be possible, with reference to those districts near St. Pancras, where there is a great deal of confusion and intersection, to give a greater area of clearance; that after the toll had been paid upon one of those districts, that toll should clear for a certain distance round, although the person having paid the toll might pass into another district; and evidence was given by the surveyor that it would lead to so much evasion that it would be hardly possible for the trustees to entertain the proposal. Have you considered that?—I have often considered it, and it would lead to inconveniences of this sort. Take, for example, Kensington and Uxbridge. Assume that Kensington cleared the other, you would have to let your tolls upon both trusts together. I only state that as one objection; I do not think it is insurmountable. In short, as we cannot give any great relief by setting the gates further back, several projects have occurred to me of affording some relief locally. Now at Kensington and Uxbridge, if notice had not been given of this Committee, we had intended to open the road called Addison-road, so that the people of Kensington might go from one part of the parish to another free of toll. The principal objection which appears to me to the tickets all circulating in the inner circle is this, we must enlarge very much the letting of the tolls. Now Uxbridge and Kensington, in that case, would have to be let together, because in the case of two different lessees, by stealth or by design, or otherwise, one might give his tickets to the other's people to clear all the other gates, whereas if they were let together, that would meet it. But then it comes to a very large lot; there would be very few people who would bid for the tolls. For a toll letting at 8,000 *l.*, or 10,000 *l.*, or 12,000 *l.*, you have a variety of competition, but if you let them only in lots of 25,000 *l.* or 30,000 *l.*, that places you in the hands of perhaps one or two lessees.

1651. Mr. *Alcock.*] With respect to the general principle of turnpike gates, as a general principle, I apprehend that a Turnpike Act which has expired is not renewed, supposing that there is no debt?—I never knew one rejected on that account. When I attended more to the business they were more frequent than now. Turnpikes have gone rather out of fashion since railways have come in; formerly there was great attention paid to turnpikes in all parts of the kingdom.

1652. Then you do not remember to have been acquainted or to have heard of cases where they purposely kept a small debt on a trust in order to have a plea for coming to Parliament for a renewal of the Act?—I never heard of such a case; it may have arisen.

1653. Mr. *Butler.*] Does your Lordship think that some plan may be devised by which if the maintenance of the roads were thrown upon the parishes, and at the same time a payment in aid were collected in respect of each horse, there would necessarily be any objection to impose those provisions?—I do not know about each horse; I have considered that half the horses in London never see a turnpike gate; take the brewers in the London traffic, and other tradesmen, there are hardly any, I believe, go out of London; a very limited number of brewers' carts go out of London; the same as to coals and as to the job horses; the principal horses that come through the turnpikes are for what is called the long traffic. I believe the traffic may be divided into pretty nearly four heads in London. The first and the largest is the omnibuses; then there are the vans from the railroads, and other commercial traffic, which now form a very large item, say 12,000 *l.* a year; next the agricultural. I suppose what with hay, straw, market gardenings, and other things which come to London, they pay

pay 12,000 *l.* a year. Then perhaps the smallest division is what is called pleasure traffic, gentlemen's carriages, riding on horseback, and other things, which is very little towards the east end of the town.

1654. If it be the fact that there are 70,000 horses kept and used in the county of Middlesex, does your Lordship think that a charge per horse of 15 *s.* per head per annum to be collected through the machinery of the Assessed Tax Commission is an arrangement which might be made?—I do not think the Chancellor of the Exchequer would let us come in to interfere with his assessed taxes.

1655. Fifteen shillings per head upon 70,000 horses would give an annual receipt of 53,500, and that would be more than equal to the maintenance of your roads, Mr. Browse having stated that the estimated cost is 40,411 *l.*, so that with the 15 *s.* per head you would have a considerable surplus?—Yes.

1656. And by that means all the gates in the metropolitan district might be done away with?—Yes.

1657. Would you think the lesser of the two evils, the maintenance of the gates or the payment of 15 *s.* per horse per head?—It would be a very simple way of doing it.

1658. Sir *John Shelley.*] Can you state what proportion you think the omnibuses and the railway van traffic pay towards the whole of the tolls?—We made an estimate two years ago about the omnibuses, and then we put them at between 25,000 *l.* and 26,000 *l.* a year; but since that time we have taken the toll off at Islington, and there is a considerable evasion at St. Pancras; according to our then calculation it would not be so much as 26,000 *l.* a year.

1659. Would it be, 25,000 *l.*?—£. 22,000 or 23,000 *l.*

1660. What for the railway van traffic?—The railway van traffic we put pretty high; that and the commercial traffic together I should put at about 12,000 *l.*, and the agricultural at about 12,000 *l.* more.

1661. So that supposing the fares of omnibuses not to be reduced, the clear saving to the omnibus proprietors and to the railway van traffic together, would amount to how much?—Upwards of 20,000 *l.* a year each, perhaps.

1662. Supposing the fares are not reduced, the saving to omnibus proprietors would be somewhere about 23,000 *l.* or 24,000 *l.* a year?—Yes.

1663. You have also stated that you consider the wear and tear by the omnibuses upon the roads as being the worst of all?—Certainly.

1664. And they have more than once petitioned to have extra money expended upon the roads for their benefit?—Yes; their chief communication was with Sir John McAdam, who unfortunately is no more.

1665. Mr. *Bonham Carter.*] I understand that the difficulty of proceeding in the course which was laid down by yourself, and not, I believe, under any direction of Parliament, but from a general belief of its convenience: namely, removing the gates which ceased after a certain number of years, was owing principally to the deficiency of the means of carrying it out?—Yes.

1666. And the deficiency of the means arose from the loss caused by the railroads coming into London, and from the increased cost of maintaining the roads; were those two the principal points?—That is only recently, within the last three or four years, or the last two years; it has varied at different times as to the cost of granite and other things, which precluded us from going further in putting back gates; and we have been disappointed that the parishes would give us no aid in undertaking portions of the road, which I think they ought to have given us. If in Paddington, or St. Luke's or elsewhere, they had taken the latter half mile of road, that would have enabled us to have gone still further, and as that became town, we might have gone still further into the country.

1667. I am to understand your Lordship that you moved back the gates at a considerable loss of income?—Yes.

1668. The railroads appear to have had, from your returns, some effect, because they came within the gates, and your traffic, I apprehend, increased, and numerous fresh adits were created?—I look upon the introduction of railroads as affecting toll and diminishing income in this way. Take, for instance, Hounslow; there were from 800 to 1,000 horses kept for coaching and other purposes there, and there are not now 50. The coaches from London to the northern districts going out with four horses added very materially to our toll. Then there were the stage waggons; formerly everything came to London on

Right Hon. *Earl of Lonsdale.*

30 June 1856.

wheels, and now everything, speaking generally, comes by railroad; there is quite a new and different traffic from that which existed when I first interfered with these roads.

1669. A large proportion of that which came to London by those roads now comes by railroads?—Yes.

1670. And the traffic within the town over the roads, some of which are still within your charge, has very much increased?—Yes.

1671. And the cost of maintaining the most London-ward part of the roads is higher than ever it was?—It has been within the last two or three years; but that may be from other circumstances; it may be owing to the war, the dearness of provisions, and other things; we had to increase our best labourers from 14 *s.* to 15 *s.* a week, and others from 13 *s.* to 14 *s.*

1672. You are, in fact, maintaining within the gates 11 miles of very expensive roads?—Yes.

1673. And if you had had the power of throwing those upon the parishes you would have relieved yourselves of a very large sum, and would have been able to throw the gates further off?—Yes.

1674. And to continue pursuing the original plan?—Yes.

1675. Supposing it to be still your opinion that that is desirable, there are several modes suggested how it should be met; one has been mentioned by yourself, not perhaps a suggestion of your Lordship, which is the Edinburgh plan, namely, the taxing, as I understand, the houses between the gate and the end of the trust?—Yes.

1676. Did that apply only to the houses actually along the line of road?—So I have understood.

1677. Not to the parish at large?—I will not be sure; but that is what I have understood.

1678. Is there any legal impediment to replacing the gates where they were before?—None.

1679. So that even to-morrow, if the gates were replaced, and you chose to go to the houses along the line, and say, "Will you compound for placing the gates further back from London?" they would be in rather an awkward position, and would be probably very glad to make that composition?—Possibly.

1680. I presume there is a traffic also, which has grown up in the last 12 or 13 years, which is very much limited by the gates, namely, the omnibus traffic, which runs to the gates and there stops very often?—I cannot give a positive statement about that; but I doubt very much its being limited by the gates; it is convenient for them to stop there, as far as my opinion goes.

1681. You are not of opinion that the gates have any very material effect upon them?—No, I do not think so; I see that the Richmond omnibuses, which are supposed to do very well, pay a bridge toll as well as a turnpike-road toll, and a very high one.

1682. Supposing Parliament were to propose to carry a Bill to enable you to throw some part of this charge upon the parishes, or the whole of it, then you would, if so empowered, carry on the original intention of removing the gates?—We should be disposed to do so.

1683. So that, in fact, you rather ceased to carry out that which was generally admitted to be a public benefit, more from want of power than from want of inclination?—Yes.

1684. And that power is constantly given in private Acts by Lord Shaftesbury's clause?—Lord Shaftesbury set the example, which, I believe, is continued still, of not admitting any part of a town; now it is very difficult to define what a town is in the suburbs of London; when it was a new road, as in the case of Old-street, and so forth, it was clear and decisive what a town was; but take Kilburn, some people would call that a village, others a town; I believe it would be a very great convenience, and it is what we contemplated doing, to put Kilburn-gate back as far as Willesden-lane to free the village of Kilburn.

1685. I suppose the districts over which your roads run may, generally speaking, though the definition of the line is very difficult, be divided into rural, suburban, and purely urban districts?—Yes.

1686. But the lines would be very difficult to define?—Yes.

1687. At the same time, those lines will be gradually going every year further off from London?—Yes.

1688. And

1688. And every year those gates near London will become greater nuisances?—Yes.

1689. Would it not be desirable to forestall this nuisance in some way, if we could possibly devise a plan?—If we could possibly devise a plan; but what I am puzzled about is, that I do not know what plan to propose.

1690. Your Lordship is aware of the district which has been lately constituted, called the area of the Metropolitan Local Management Act, and that that area is under the authority of a Board which has the power of rating the whole of it?—Yes.

1691. Supposing it were possible to rate the inhabitants at a uniform amount, for the portions of your road within it, it would be necessary, I presume, to throw all the highways within that district together, in order to prevent any injustice?—Yes.

1692. What should you think of an amalgamation of all the highways within the metropolitan area at a uniform rate?—I rather think in a general way there are objections to all, and difficulties; but I think generally the parishes take the best care of their own roads.

1693. The inconvenience which has been shown with regard to parishes, in a paper which has been put before the Committee, is that certain small parishes which do not derive, being small portions of the metropolis, any extra benefit from the road itself, are very often extremely taxed, from the arbitrary area which parishes assume?—Yes.

1694. And that is felt, I think, as a considerable difficulty, in the way of throwing the roads upon the parish?—Yes.

1695. A larger or composite area has been suggested. I wish to ask your Lordship whether any *primâ facie* objection is raised in your mind to the adoption of the larger area instead of the smaller one?—In adopting the larger area, people complain of being taxed for that from which they derive no benefit; you must have some boundary, but there is the difficulty as to the area.

1696. But if you take the aggregate of the small areas, and set off the one against the other, one will find itself ready to adopt it, and the other will complain very much of the burthen?—I have considered the thing in all shapes and ways, and I have not been able to find a plan which I think would be acceptable to the community at large.

1697. Sir *Benjamin Hall.*] Has your Lordship had many representations made to the Commission, setting forth the expediency of abolishing the tolls?—No; very few, if any.

1698. Can you state how many have been made within the last two years?—I do not recollect one, except about two years, as regards Kensington; in fact I recollect now that there have been several as regards Kensington; Notting-hill is the great one.

1699. But I am speaking of the question generally, as regards the abolition of tolls within the metropolitan area?—It is only as regards a particular toll-bar; I do not recollect a single one of any sort except that.

1700. I think there was a deputation waited upon your Lordship, about a month or six weeks ago?—Yes.

1701. Was that in relation to the abolition or reduction of tolls?—I recollect I asked the question, whether they were for the reduction of tolls or the abolition of tolls altogether; they said, either, but that they were against tolls altogether.

1702. That was a deputation, I believe?—Yes.

1703. Can you state to the Committee who composed that deputation; whether it emanated from the omnibus proprietors?—There were various other persons; Mr. Roy, from Notting-hill, and a clergyman, I think, from Kensington; there were three or four different parties.

1704. Have there been any other deputations, besides that one, urging upon the Commissioners the abolition or reduction of tolls?—Not recently.

1705. By a Paper which has been presented to Parliament I see that the amount of income received by the Commission in the year is about 65,000 *l.*?—It was so last year; I do not think this year it will be above 58,000 *l.*; that is, the tolls will not be.

1706. But according to the Return presented last year?—Do you mean income, or toll-letting?

Right Hon. *Earl of Lonsdale.*

30 June 1856.

1707. The receipt by tolls, including the trust money; it is at page 3 of the Report?—Yes.

1708. It appears from the evidence which is there given, that out of that sum of 65,000 *l.*, 23,000 *l.* is paid by the proprietors of omnibuses, 12,000 *l.* by the owners of railway vans, and other traffic in relation to railways, and 12,000 *l.* by persons coming from country districts, and therefore it would appear that there is only 18,000 *l.* paid by the general public?—I do not know; I think my definition was this, that there was upwards of 20,000 *l.* paid by the omnibuses, 12,000 *l.* for commercial traffic, about 12,000 *l.* for agricultural traffic, and somewhere about 10,000 *l.* or 12,000 *l.* for what is called pleasure traffic, which is carriages, and horses, and gigs, and *et ceteras*.

1709. In point of fact, the tolls which are taken for general traffic, independently of trade and omnibuses, railway vans, and market gardeners, bears a very small proportion to the whole of the tolls received at the gates?—Yes, that is the pleasure traffic; it is very small indeed.

1710. Then the Commission has received hardly any representation, setting forth the expediency of abolishing the tolls?—No.

1711. And no representation has come from any parish excepting Chelsea?—No.

1712. Then assuming that the proprietors of omnibuses pay a sum varying from 20,000 *l.* to 23,000 *l.*, and that there is no reduction made in the charge for passenger traffic, that sum would go into the pockets of the omnibus proprietors if the tolls were abolished?—Yes, it would benefit them so far; I do not know what is the extent of their capital, or what effect it would have.

1713. Mr. *Hildyard.*] It has been represented to us that there is now in the depôts, if I may call them so, upon the Kensington-road, metal sufficient to keep that road in a proper state for two years in advance; is that the case?—Oh, no; a heap of granite looks something large by the side of a road, but we have a peculiarity upon that road; we have indentures there, a sort of wide places which are convenient to put granite upon, which saves us the hiring of a depôt, there are about 800 yards of it; it looks rather large, but it is a quantity that we shall get rid of before Christmas. I think they use on that road from 1,500 to 1,800 yards of granite a year; there is not half a year's granite there.

1714. I believe you import your granite in the summer, it being much cheaper to do so?—It is more convenient, because you save travelling over the roads in wet weather, and it is also more convenient to put it by the side of the road there.

1715. And it is also, I imagine, because the granite vessels can make their passage better in this season of the year than they would do in winter, and you can buy it cheaper?—Yes.

1716. Is that kept for that road exclusively?—As far as Kensington Town goes; as high as Kensington church.

1717. Mr. *Bonham Carter.*] I think I understood you to say that if you removed back the different gates to the amount of half or three-quarters of a mile, the probable loss to the trust would be about 16,000 *l.* a year?—Yes.

1718. And if you were to advance them in the like proportion, there would be a similar gain?—Yes.

1719. Then, in point of fact, the concession to the public by having moved the gates half a mile has also been a gain to the parishes in which those roads are to that amount?—Yes.

1720. And the inhabitants of those parishes are the people who for some years past have been interfering with the extension of that boon to the public which would have been otherwise obtained?—Yes.

1721. If you had had the power to put it upon them, should you not have considered that they would have been the right persons to undertake those roads?—Yes.

1722. So that, in point of fact, the public is suffering very much from their assumed unwillingness to take the roads?—Yes.

1723. *Chairman.*] You stated that the Commission was composed originally, among other persons, of brewers and brickmakers?—Some of them.

1724. Were those persons put upon the Commission as being supposed to represent the traffic?—No; we looked out for the most respectable and right-headed men in the county, as we thought, at that time. There was Sampson Hanbury, the brewer, and Mr. Hobson, the great brickmaker.

1725. They

1725. They were all large toll-payers, were they not?—I believe the brewers pay very little toll; there are a few that go out of London, but not many.

1726. Then it was not with any view of selecting a representation for the toll-paying interest?—No.

1727. Did it ever occur to your Lordship that any persons of that class might be put into the Commission?—No.

1728. I think you stated that the railway vans and that description of traffic pay an additional toll, did you not?—Yes, upon narrow wheels.

1729. They carry an immense deal of coal, do not they?—No, I think not, upon the north side of the town; the greatest quantity of coal goes by the river. There are coal wharves at Kensington, Brentford, Hammersmith, and all the way up the river.

1730. There is a great competition in coal in London, is there not?—Yes.

1731. Then, so far as the toll goes, paid upon coal, it is a tax upon coal, is it not?—Yes; but at Islington, for instance, there is a great deal of coal carried about there from the depôts; I do not know whether that pays. I rather think from Highbury depôt to a very large part of Islington it can be sent without paying toll.

1732. A great deal has been said about omnibuses; you have put in memorials which were addressed to the Commissioners by the omnibus proprietors; I think your Lordship said in your evidence that the coach proprietors and the mail-coach owners had also memorialised the Board to make the roads better?—No; that was to the Committees which I sat upon, David Gilbert's Committee. Horne and William and all those people were the chief movers for the original Committees which sat in the House of Commons from 1819 to 1824.

1733. They alleged that they suffered from the badness of the roads?—Yes.

1734. And therefore, of course, all those who are to be the conveyers of the public who travel over the roads, are the people who would naturally apply to have the roads made better?—Yes.

1735. It has been said that the pleasure traffic bears but a small proportion to that of the omnibus traffic and others?—Yes.

1736. It has been stated that the omnibuses convey some millions of the inhabitants of London, principally of the lower class?—All classes of people.

1737. Therefore, in point of fact, the pleasure traffic, which is the traffic of the rich, pays a very small proportion compared with the traffic of the poorer classes?—Yes.

1738. I presume that the really important matter is to keep the roads good where there is such an enormous communication, and constantly increasing buildings, and increasing population?—Yes.

1739. The omnibuses are, in point of fact, the great conveyers of that traffic?—Yes.

1740. Therefore whatever interferes with that communication is in so far an evil, and a great one?—Yes.

1741. I think your Lordship stated, or at all events it has been stated, that a great part of the traffic in London of those heavy vans pays no toll at all?—No.

1742. Brewers' drays, your Lordship has mentioned as an instance, pay no toll at all?—Not beyond a limited extent.

1743. That enormously heavy traffic passes, therefore, partly over the roads which are supported by those tolls, but which they evade by not passing through the gates, and partly over roads which are supported by the parishes through which they run?—Yes.

1744. I do not know whether I ought again to put the question, whether in point of justice you see any real reason why those large parishes, or why any parishes forming an area of taxation, should, when they become a town, be exempt from that tax which is paid by all the other parishes in the town?—No; it would be more equitable for them to pay, certainly.

1745. I believe the parishes of Paddington and Marylebone not only have some portions of roads paid by a toll, but I believe in their own parishes where the toll-gates do not exist, they receive from the Lyon Trust a sum of money for the repair of the roads, do not they?—Yes.

1746. That trust is increasing, is it not?—No, it has got to nearly its length till the building leases shall terminate; it has increased very much within the last few years, but all the ground is let now, and there will be no increased income until the expiration of those leases.

1747. In point of fact, it has become much more valuable, has it not, than it

Right Hon. *Earl of Lonsdale.*

30 June 1856.

was formerly?—Yes; it is up to about 3,000 *l.* a year, but it is not likely to increase or improve, certainly not to any extent, because the whole ground is actually let.

1748. But in so far, whatever they have received, which is stated to be 2,000 *l.* in one year, they have benefited?—There is a certain portion, because the will of Lyon was "to London." At that time Oxford-street was a turnpike road, and Paddington until this Bill passed.

1749. As to the question of rating a large area, in answer to a question from a Member of the Committee, you stated that you thought the parishes would look after their own roads better than in the case where it was proposed that there should be a general highway rate over the whole of the district within the area of the Metropolitan Local Management Act?—Yes.

1750. Supposing they still continue to manage their roads, and the matter was arranged in the following way, namely, that each parish should, as it does now, in the early part of the year receive an estimate of what the supposed amount of the cost of the highways would be for the following year, then that all those parishes should send those estimates to the Central Board; that the Central Board should put all those estimates together, and should then strike an uniform highway rate over the whole of the district within their area, and then that the parishes should collect that rate and pay it into the central fund and have the power to draw the amount of their own roadway, and to manage their roads, in point of fact, just as they did before, only with this difference, that the sum total should be considered the amount due to the whole highways, and should be paid for by an uniform rate over the whole area. Does your Lordship see *primâ facie* the same objection lie to that?—It is a new scheme; it would want some consideration to form any decisive opinion upon it.

1751. The parishes are, in fact, an arbitrary boundary, and, of course, there would be a certain amount of inequality; some would have to repair highways very costly, others not; still up to the present moment, there having been uniformly throughout England the practice, namely, that parishes should repair their own roads, your Lordship, I understand, at the present moment sees no better means of doing it than that?—No, not at this moment.

1752. Sir *William Jolliffe.*] Of course any general rate would be a benefit to the parish that had to maintain the most expensive roads?—Certainly.

1753. But that benefit would be at the expense of those parishes who had the least expensive roads?—Certainly.

1754. With regard to any general taxation, such as a general tax upon horses in Middlesex, do you think that would be a more equitable mode of maintaining the whole of the highways in Middlesex than a parochial rate?—No, I think not; I think the city of London, and so forth, would raise a great objection to it.

1755. That would be a substitution for the common law liability that now exists in the United Kingdom?—I thought you meant only to apply it to London.

1756. But as far as Middlesex goes, it would be a substitution for the common law liability of parishes as to highways; it would substitute a local taxation?—Yes; it is very difficult to deal with.

1757. Do you see any reason to suppose that it would be a more just and equitable tax than the present one?—I have only turned my attention to it when it has been submitted to our Board that a tax upon horses should be so levied. I have looked into the question, and I found that the greatest number of horses kept in London were confined to London itself, from the information I got, even of gentlemen's horses and tradesmen's; there are a certain number that may go out to Kensington, or just out of London, but the great majority are confined to London streets, and do their work there.

1758. Is there any doubt that property in the neighbourhood of turnpike gates is deteriorated, and that in proportion as the turnpike gates are taken away the property in the immediate neighbourhood is increased in value?—It is deteriorated in some particular localities, no doubt. If I were an inhabitant of Kensington, I should wish the gate away. I dare say the whole parish of Kensington will be built over; it is an impediment, to a certain extent, from what I know of other places. In a place of which I have some knowledge, I know it is said that land does not let for building there readily, because they have two gates to pay to go to London.

1759. On

1759. On this side of Notting-hill a great impetus appears to have been given by some circumstance, at all events, to building upon that land?—Yes.

1760. And some complaint exists, I believe, as to deterioration of property in consequence of Notting-hill gate; that it does not let so readily after you get to Notting-hill as on the London side of it?—It is a matter of calculation; I know at the place I refer to, namely, Barnes, in Surrey, where I have a farm to which I go, it is said that people do not build houses there because it is almost equal to house rent, paying the Hammersmith Bridge and the other toll to come up to London.

1761. Do not you think that, supposing Notting-hill gate was removed quite out of the parish of Kensington and put into the adjoining parish, the road being maintained by the Commissioners by the collection of a sufficient portion of toll from gates further off, the inconvenience and injustice would be somewhat increased upon those suburban parishes which are still beyond the gates?—It would be; I do not know as to Notting-hill; for the protection of our revenue we have another gate about a mile beyond Notting-hill, and it is taking down that first gate as to which I have made a calculation of the loss being about 1,500*l.* or 2,000*l.*; the second gate is already up there.

1762. Supposing it was moved out of the parish of Kensington altogether, and put into the parish of Hammersmith?—I dare say the property of Kensington would be much improved.

1763. The whole toll being collected in Hammersmith, the same complaint would be made by Hammersmith as now exists in Kensington?—In the course of time, when Kensington was built over, the building would go to Hammersmith.

1764. Mr. *Wrightson.*] I see it is stated at about the time of the commencement of this Commission, that there was a great principle adopted that a parish had no claim to get rid of its common law liability to maintain its own roads unless its highways cost as much as 6*d.* in the pound; has your Lordship any recollection of that being the great principle acted upon at that time?—I do not know that.

1765. It was stated, I think, in the Committee of the House of Commons, as early as the period of this Commission, to be the principle that was then recognised and acted upon; do you consider it so?—No.

1766. *Chairman.*] I do not know whether your Lordship remembers that the Commission were so flushed with the success of their scheme of 1830, that in the House of Commons, in answer to some question by Mr. Hume, your Lordship stated publicly, that you yourself should not rest satisfied so long as there was a gate left within 10 miles of the metropolis?—No, I do not know that; I should like to see the day.

1767. Your Lordship does not remember saying that?—No; Mr. Hume was one of our Commissioners.

1768. Sir *William Jolliffe.*] If your Lordship contemplated that event, you contemplated at the same time that the roads would be maintained by the parishes, did you not?—Undoubtedly.

1769. Mr. *Butler.*] As to the constitution of the Commission, has there recently been an election of Commissioners?—Two years ago.

1770. In what way was the election made?—It is self-election.

1771. Was notice given to the other Commissioners to attend?—All of them.

1772. Did it state at the bottom of the summons, that they were to attend for that purpose?—Yes.

1773. It has been mentioned that some inconvenience has arisen from the fact of the officers of your Commission holding other offices; has your Lordship found any inconvenience in that?—No; it is a matter of economy; they are two very able men, and if we did not allow them to do so, we should have to pay them larger salaries; as to one of them it is essentially necessary that he holds also another place, because he is the toll-collector on the Commercial-road, and he has always a staff ready for any emergency, which now has occurred; for we have not let our largest trust, the Highgate and Hampstead, and he has a staff ready to put into the collection.

1774. Referring back to the question of the Commissioners, may I ask who

Right Hon. *Earl of Lonsdale.*

30 June 1856.

were elected two years ago?—They are printed before Parliament; the names are given there.

1775. Were they resident within the area of the district?—Lord Portman and Lord Enfield, and some of the Peers; the original constitution was, that there should be six Peers, and I think 40 Commissioners.

1776. Do you remember the number that were elected at that time?—Somewhere about 15 or 20; I will not be quite sure; I could let you know.

1777. Is it a matter of principle with the Commissioners that they should elect from the several districts in order that the representative principle, as far as possible, might be carried out?—That is so practically; they elect people of particular districts.

1778. Then the Commission does, to a certain extent, partake of the representative character?—It was so originally, and we have kept it up to a certain extent.

LIST OF APPENDIX.

Appendix, No. 1.

Paper delivered in by Henry Browse, Esq.:

Lengths and Estimated Cost of the Metropolis Roads in the several Parishes through which they pass, within the limits of the Metropolitan Local Management Act, with the Amounts of Assessment to the Poor, and the Rate in the Pound - - - - - p. 110

Lengths and Estimated Cost of the Metropolis Roads in the several Parishes through which they pass, beyond the limits of the Metropolitan Local Management Act, with the Amounts of Assessments to the Poor, and the Rate in the Pound - - - - - p. 111

Appendix, No. 2.

Return of Sums received by the Commissioners from the Trust Estates of John Lyon (known as the Paddington and Kilburn Estates), and from the Trust Estate of Edward Harvist; together with the Appropriation of the same, agreeably to the Act 10 Geo. 4, c. 59, during Five Years ended 25th March 1856 - - - - - - - - - - - - p. 112

Appendix, No. 3.

Dates of the Meetings of the Commissioners of the Metropolis Roads from July 1854 to June 1856, and the Number of Commissioners attending each Meeting - - - - p. 114

Names of the Commissioners who attended the Meetings of the Board and Committees, and the Number of Attendances of each from July 1854 to June 1856 - - - - - p. 114

Appendix, No. 4.

Paper furnished by H. Browse, Esq.:

City-road Gate.—Traffic Check from 12 o'clock Friday Night, June 27, to 12 o'clock Saturday Night, June 28, 1856 - - - - - - - - - - p. 115

Cambridge-heath Gate.—Traffic Check from 12 o'clock Wednesday Night, June 25, to 12 o'clock Thursday Night, June 26, 1856 - - - - - - - - p. 115

Islington Gate.—Traffic Check from 12 o'clock Wednesday Night, June 25, to 12 o'clock Thursday Night, June 26, 1856 - - - - - - - - - p. 116

Chalk Farm Gate.—Traffic Check from 12 o'clock Wednesday Night, June 25, to 12 o'clock Thursday Night, June 26, 1856 - - - - - - - - - p. 116

Hampstead-road Gate.—Traffic Check from 12 o'clock Wednesday Night, June 25, to 12 o'clock Thursday Night, June 26, 1856 - - - - - - - - p. 117

Kentish-town Gate.—Traffic Check from 12 o'clock Friday Night, June 27, to 12 o'clock Saturday Night, June 28, 1856 - - - - - - - - - p. 117

Pancras Gate.—Traffic Check from 12 o'clock Friday Night, June 27, to 12 o'clock Saturday Night, June 28, 1856 - - - - - - - - - - - p. 118

Maiden-lane Gate.—Traffic Check from 12 o'clock Wednesday Night, June 25, to 12 o'clock Thursday Night, June 26, 1856 - - - - - - - - - p. 118

Ball's Pond Gate.—Traffic Check from 12 o'clock Wednesday Night, June 25, to 12 o'clock Thursday Night, June 26, 1856 - - - - - - - - - p. 119

A P P E N D I X.

Appendix, No. 1.

PAPER delivered in by *Henry Browse*, Esq.

Appendix, No. 1.

LENGTHS and ESTIMATED COST of the METROPOLIS ROADS in the several Parishes through which they pass, within the limits of the Metropolitan Local Management Act, with the Amounts of Assessment to the Poor, and the Rate in the Pound.

PARISHES.	Lengths.			Estimated Cost.	Assessment to the Poor Rate.	Rate in the Pound.	
	Miles.	*Fur.*	*Yds.*	£.	£.	*s.*	*d.*
St. Margaret's and St. John's	0	7	16	1,300	251,226	–	1 ¼
Chelsea	1	0	198	850	209,118	–	1
Kensington	7	0	108	5,400	270,200	–	4 ¾
St. George's	0	5	116	1,260	746,434	–	– ½
Fulham	4	3	81	1,350	52,100	–	6 ¼
Hammersmith	4	4	174	3,141	55,200	1	1 ½
Paddington	2	3	72	2,940	477,597	–	1 ½
Hampstead	1	6	115	1,300	96,601	–	3 ¼
St. Marylebone	0	3	110	500	937,701	–	– ⅛
St. Pancras	7	2	76	5,600	800,369	–	1 ⅛
Islington	8	4	217	6,900	491,100	–	3 ½
Clerkenwell	0	0	330	250	196,480	–	– ¼
St. Luke's	0	6	92	2,150	150,000	–	3 ¼
St. Leonard's	1	2	22	1,400	244,988	–	1 ¼
Stoke Newington	2	0	42	700	27,027	–	6 ½
Hackney	7	7	0	4,350	223,817	–	4 ¾
Bethnal Green	1	5	66	1,020	151,023	–	1 ¾
	53	1	75	40,411	5,380,981		

LENGTHS and ESTIMATED COST of the METROPOLIS ROADS in the several Parishes through which they pass, beyond the limits of the Metropolitan Local Management Act, with the Amounts of Assessment to the Poor, and the Rate in the Pound. Appendix, No. 1.

PARISHES.	Lengths.			Estimated Cost.	Assessment to the Poor Rate.	Rate in the Pound.
	Miles.	*Fur.*	*Yds.*	£.	£.	*s.* *d.*
Chiswick	1	6	62	1,298	19,013	1 4½
Ealing	3	0	77	1,852	45,675	– 7½
New Brentford	1	3	161	252	6,611	– 9¼
Isleworth	3	7	137	1,530	28,242	1 1
Twickenham	1	6	133	315	28,329	– 2¾
Teddington	1	2	127	141	5,898	– 5¾
Cranford	0	2	215	50	2,290	– 4
Heston	4	6	122	1,053	20,355	1 –½
Hillingdon	2	1	105	504	27,155	– 4⅛
Hayes	2	2	187	570	10,067	1 1½
Norwood	2	1	132	540	11,268	1 –
Hanwell	1	7	126	300	6,740	– 11
Acton	1	5	176	969	13,633	1 5
Willesden	4	4	110	1,160	22,960	1 –
Harrow	4	4	0	346	39,632	– 2
Great Stanmore	1	6	0	216	5,990	– 8¾
Little Stanmore	1	3	156	237	3,963	1 2¼
Kingsbury	1	3	0	236	4,370	1 2¾
Bushey	0	4	88	60	10,469	– 1½
Edgeware	0	4	117	103	4,180	– 6
Hendon	2	2	44	387	26,549	– 3⅛
Tottenham	5	4	185	2,184	50,973	– 10¼
Hornsey	0	4	96	150	36,560	– 1
Enfield	3	4	110	1,110	40,342	– 6¾
Edmonton	7	3	0	1,710	44,456	– 9¼
Walthamstow	1	2	110	248	25,300	– 2½
Layton	3	1	110	606	17,106	– 8½
Woodford	0	3	0	80	11,741	– 1¾
Wanstead	0	1	165	50	8,939	– 1¼
	68	1	191	18,257	578,806	

Appendix, No. 2.

RETURN of Sums Received by the Commissioners from the Trust Estates of *John Lyon* (known as the Paddington and Kilburn Estates), and from the Trust Estate of *Edward Harvist*; together with the Appropriation of the same, agreeably to the Act 10 Geo. 4, c. 59, during Five Years ended 25th March 1856.

YEAR to 25th March 1852.

RECEIPTS.	£.	s.	d.
From Governors of Harrow School: on account of Paddington Estate - - -	1,000	–	–
From Governors of Harrow School: on account of Kilburn Estate - - -	1,000	–	–
£.	2,000	–	–

APPROPRIATION.	£.	s.	d.
Paid parish of Marylebone 3/20ths of 1,000 *l.* received as per contra - - - -	150	–	–
Paid parish of Paddington 1/11th of 1,000 *l.* received as per contra - - - -	90	18	3
Applicable to repairing and improving the 6th District (Harrow Road) - - -	759	1	9
Paid parish of Marylebone 7/39ths of 1,000 *l.* received as per contra - - - -	179	9	6
Paid parish of Paddington 2/39ths of 1,000 *l.* received as per contra - - - -	51	5	8
Applicable to repairing and improving 7th and 8th Districts (Kilburn Road) - -	769	4	10
£.	2,000	–	–

YEAR to 25th March 1853.

RECEIPTS.	£.	s.	d.
From Governors of Harrow School: on account of Paddington Estate - - -	1,750	–	–
From Governors of Harrow School: on account of Kilburn Estate - - -	1,450	–	–
£.	3,200	–	–

APPROPRIATION.	£.	s.	d.
Paid parish of Marylebone 3/20ths of 1,750 *l.* received as per contra - - - -	262	10	–
Paid parish of Paddington 1/11th of 1,750 *l.* received as per contra - - - -	159	1	11
Applicable to the 6th District (Harrow Road) - - - - - - -	1,328	8	1
Paid parish of Marylebone 7/39ths of 1,750 *l.* received as per contra - - - -	260	4	10
Paid parish of Paddington 2/39ths of 1,750 *l.* received as per contra - - - -	74	7	2
Applicable to the 7th and 8th Districts (Kilburn and Edgware Road) - - -	1,115	8	–
£.	3,200	–	–

YEAR to 25th March 1854.

RECEIPTS.	£.	s.	d.
From Governors of Harrow School: on account of Paddington Estate	1,500	–	–
From Governors of Harrow School: on account of Kilburn Estate	1,200	–	–
From Brewers' Company: on account of Harvist's Estate (rent, interest, and dividends)	1,105	–	1
£.	3,805	–	1

APPROPRIATION.	£.	s.	d.
Paid parish of Marylebone 3/20ths of 1,500 *l.* received	225	–	–
Paid parish of Paddington 1/11th of 1,500 *l.* received	136	7	3
Applicable to repairing the 6th District (Harrow Road)	1,138	12	9
Paid parish of Marylebone 7/39ths of 1,200 *l.* received	215	7	6
Paid parish of Paddington 2/39ths of 1,200 *l.* received	61	10	9
Applicable to the 7th and 8th Districts (Kilburn, &c., Roads)	923	1	9
Paid parish of Marylebone 1/16th of 1,105 *l.* 0 *s.* 1 *d.* received	69	1	3
Paid parish of Paddington 1/16th of 1,105 *l.* 0 *s.* 1 *d.* received	69	1	3
Applicable to the 7th and 8th Districts (Kilburn, &c., Roads)	966	17	7
£.	3,805	–	1

YEAR to 25th March 1855.

RECEIPTS.	£.	s.	d.
From Governors of Harrow School: on account of Paddington Estate	1,750	–	–
From Governors of Harrow School: on account of Kilburn Estate	1,750	–	–
£.	3,500	–	–

APPROPRIATION.	£.	s.	d.
Paid parish of Marylebone 3/20ths of 1,750 *l.* received	262	10	–
Paid parish of Paddington 1/11th of 1,750 *l.* received	159	1	10
Applicable to 6th District (Harrow Road)	1,328	8	2
Paid parish of Marylebone 7/39ths of 1,750 *l.* received	314	2	–
Paid parish of Paddington 2/39ths of 1,750 *l.* received	89	14	11
Applicable to 7th and 8th Districts (Kilburn, &c., Roads)	1,346	3	1
£.	3,500	–	–

YEAR to 25th March 1856.

RECEIPTS.	£.	s.	d.
From Governors of Harrow School: on account of Paddington Estate	1,500	–	–
From Governors of Harrow School: on account of Kilburn Estate	1,750	–	–
From Brewers' Company: on account of Harvist's Estate	166	9	5
£.	3,416	9	5

APPROPRIATION.	£.	s.	d.
Paid parish of Marylebone 3/20ths of 1,500 *l.* received	225	–	–
Paid parish of Paddington 1/11th of 1,500 *l.* received	136	7	3
Applicable to 6th District (Harrow Road)	1,138	12	9
Paid parish of Marylebone 7/39ths of 1,750 *l.* received	314	2	–
Paid parish of Paddington 2/39ths of 1,750 *l.* received	89	14	11
Applicable to 7th and 8th Districts (Kilburn, &c., Roads)	1,346	3	1
Paid parish of Marylebone 1/16th of 166 *l.* 9 *s.* 5 *d.* received	10	8	1
Paid parish of Paddington 1/16th of 166 *l.* 9 *s.* 5 *d.* received	10	8	1
Applicable to the 7th and 8th Districts (Kilburn, &c., Roads) (Six hundred pounds paid this year for Bill.)	145	13	3
£.	3,416	9	5

Appendix, No. 3.

Appendix, No. 3.

DATES of the Meetings of the Commissioners of the METROPOLIS ROADS from July 1854 to June 1856, and the Number of Commissioners attending each Meeting.

BOARDS.			COMMITTEES.		
1854:					
28 July	8	Commissioners attending	2	26 July	1854.
25 August	4	- - - - -	2	23 August	„
20 October	7	- - - - -	2	18 October	„
1 December	7	- - - - -	2	15 November	„
1855:					
12 January	5	- - - - -	3	10 January	1855.
9 February	8	- - - - -	4	6 February	„
9 March	8	- - - - -	2	6 March	„
15 March	5	- - - - -	3	27 March	„
29 March	8	- - - - -	4	11 April	„
10 May	9	- - - - -	2	8 May	„
11 May	4	- - - - -	2	12 June	„
15 June	9	- - - - -	3	10 July	„
13 July	8	- - - - -	2	7 August	„
10 August	8	- - - - -	3	18 September	„
21 September	5	- - - - -	3	16 October	„
19 October	7	- - - - -	2	13 November	„
16 November	6	- - - - -	3	11 December	„
14 December	5	- - - - -	2	8 January	1856
1856:					
11 January	5	- - - - -	2	5 February	„
8 February	3	- - - - -	4	4 March	„
7 March	5	- - - - -	4	1 April	„
4 April	9	- - - - -	3	6 May	„
9 May	15	- - - - -	3	10 June	„
20 May	8				
13 June	11		62		
	177				

NAMES of the Commissioners who attended the Meetings of the BOARD and COMMITTEES, and the Number of Attendances of each from July 1854 to June 1856.

	BOARDS.	COMMITTEES.
The Earl of Lonsdale - - -	12	1
The Marquis of Westminster - -	1	
Lord Portman - - - - -	1	
Lord Ranelagh - - - - -	2	
Lord Robert Grosvenor - - -	2	
Sir William Jolliffe - - - -	15	4
Sir James Duke - - - - -	4	
Sir Frederick Pollock - - -	5	
Mr. Jones - - - - -	18	17
Mr. Austin - - - - -	24	21
Mr. Chapman - - - - -	6	
Mr. Pownall - - - - -	16	
Mr. Kemshead - - - - -	17	18
Mr. Mildred - - - - -	18	
Mr. Somerset - - - - -	9	
Mr. Day - - - - - -	9	
Mr. Williams - - - - -	3	
Colonel Rushout - - - -	3	
Mr. Milne - - - - -	2	1
Mr. Bayley - - - - -	10	
	177	62

Appendix, No. 4.

PAPER furnished by *H. Browse*, Esq.

CITY ROAD GATE.

Traffic Check from 12 o'Clock Friday Night, June 27, to 12 o'Clock Saturday Night, June 28, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	97	97
One-horse cabs and broughams	1,399	1,399
Two-horse carriages	61	122
One-horse carts	674	674
One-horse vans	69	69
Two-horse carts	20	40
Two-horse vans	36	72
Three-horse vans	5	15
Four-horse vans	1	4
Two-horse omnibuses	822	1,644
Horses not drawing	86	86
Cattle	14	14
	3,284	4,236

CAMBRIDGE HEATH GATE.

Traffic Check from 12 o'Clock Wednesday Night, June 25, to 12 o'Clock Thursday Night, June 26, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	54	54
One-horse cabs	85	85
One-horse carriages	97	97
Two-horse carriages	26	52
One-horse carts	464	464
One-horse vans	24	24
Two-horse carts	40	80
Two-horse vans	19	38
Three-horse waggons	23	69
Four-horse waggons	—	—
Two-horse omnibuses	223	446
Three-horse omnibuses	3	9
Four-horse omnibuses	5	20
Horses not drawing		17
Beasts		1
	1,063	1,456

Appendix, No. 4.

ISLINGTON GATE.

TRAFFIC CHECK from 12 o'Clock Wednesday Night, June 25, to 12 o'Clock Thursday Night, June 26, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	131	131
One-horse cabs	698	698
One-horse carriages	380	380
Two-horse carriages	104	208
One-horse carts	657	657
One-horse vans	68	68
Two-horse carts	71	142
Two-horse vans	—	—
Three-horse waggons	19	57
Four-horse waggons	16	64
Two-horse omnibuses	634	1,268
Three-horse omnibuses	8	24
Four-horse omnibuses	6	24
Horses not drawing		41
Beasts		5
	2,792	3,767

CHALK FARM GATE.

TRAFFIC CHECK from 12 o'Clock Wednesday Night, June 25, to 12 o'Clock Thursday Night, June 26, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	42	42
One-horse cabs	261	261
One-horse carriages	185	185
Two-horse carriages	100	200
One-horse carts	471	471
One-horse vans	73	73
Two-horse carts	18	36
Two-horse vans	30	60
Three-horse waggons	29	87
Four-horse waggons	6	24
Two-horse omnibuses	70	140
Three-horse omnibuses	64	192
Horses not drawing		57
Sheep and beasts		13
	1,349	1,841

HAMPSTEAD ROAD GATE.

Appendix, No. 4.

TRAFFIC CHECK from 12 o'Clock Wednesday Night, June 25, to 12 o'Clock Thursday Night, June 26, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	118	118
One-horse cabs	403	403
One-horse carriages	165	165
One-horse carts	439	439
One-horse vans	88	88
Two-horse carts	27	54
Two-horse vans	15	30
Three-horse carts and waggons	12	36
Four-horse waggons	5	20
Horses not drawing	-	49
Asses	-	17
Two-horse omnibuses	739	1,478
	2,011	2,897

KENTISH TOWN GATE.

TRAFFIC CHECK from 12 o'Clock Friday Night, June 27, to 12 o'Clock Saturday Night, June 28, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	45	45
One-horse cabs and broughams	340	340
Two-horse carriages	76	152
One-horse carts	536	536
One-horse vans	43	43
Two-horse carts	21	42
Two-horse vans	15	30
Three-horse waggons	7	21
Four-horse waggons	6	24
Two-horse omnibuses	144	288
Horses not drawing	-	66
Sheep	-	3
	1,233	1,590

Appendix, No. 4.

PANCRAS GATE.

Traffic Check from 12 o'Clock Friday Night, June 27, to 12 o'clock Saturday Night, June 28, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	71	71
One-horse cabs and broughams	343	343
Two-horse carriages	12	24
One-horse carts	304	304
One-horse vans	33	33
Two-horse carts	20	40
Two-horse vans	22	44
Three-horse carts and vans	7	21
Four-horse vans	3	12
Two-horse omnibuses	55	110
Horses not drawing	-	27
Beasts	-	2
Sheep	-	4
Asses drawing	11	11
	881	1,046

MAIDEN LANE GATE.

Traffic Check from 12 o'Clock Wednesday Night, June 25, to 12 o'clock Thursday Night, June 26, 1856.

	Number of Vehicles.	Number of Horses, &c.
One-horse gigs	250	250
One-horse cabs	180	180
One-horse carriages	139	139
Two-horse carriages	79	158
One-horse carts	450	450
One-horse vans	39	39
Two-horse carts	50	100
Two-horse vans	4	8
Three-horse waggons	13	39
Four-horse waggons	—	—
Two-horse omnibuses	89	178
Horses not drawing	-	288
Sheep	-	527
Beasts	-	15
	1,293	2,371

BALL'S POND GATE.

Appendix, No. 4.

TRAFFIC CHECK from 12 o'Clock Wednesday Night, June 25, to 12 o'Clock Thursday Night, June 26, 1856.

	Number of Vehicles.	Number of of Horses.
One-horse gigs	50	50
One-horse cabs	125	125
One-horse carriages	206	206
Two-horse carriages	48	96
One-horse carts	280	280
One-horse vans	24	24
Two-horse carts	11	22
Two-horse vans	4	8
Two-horse waggons	4	8
Three-horse waggons	3	9
Four-horse waggons	1	4
Two-horse omnibuses	61	122
Three-horse omnibuses	2	6
Horses not drawing		37
	819	997

I N D E X.

N. B.—In this Index the Figures following the Names of the Witnesses refer to the Questions in the Evidence; and those following *App. p.*, to the paging of the Appendix.

A.

ABOLITION of Tolls. Increase of accommodation generally, as well as of omnibus traffic, if the gates were removed altogether, *Browse* 230–237. 250–255.

See also *Metropolis Roads Commission. Omnibuses. Removal of Gates.*

Accounts. Witness is accountant to the Metropolis Road Commission, *Wright* 465——He cannot furnish detailed information as to the cost of collection and of maintaining the several toll-gates and side-bars, *ib.* 469–474——As regards the districts not let out by the Commissioners he can supply separate accounts of the cost of maintaining the roads and of collection, *ib.* 470–477. 483–485.

There is a yearly audit of the accounts by the Commissioners themselves; minute monthly examination by a finance committee of the Commissioners adverted to hereon, *Wright* 506–510. 532–542——Means of furnishing the amounts collected at the several gates, *Browse* 694–696. 732.

Agricultural Traffic. The agricultural traffic over the roads amounts to about 12,000 *l.* a year, *Lord Lonsdale* 1653. 1660. 1708.

Anderson, Mr. Murray. Comment on the circumstance of Mr. Anderson being engaged in other business as well as in that of the Metropolis Roads Commission, *Bradfield* 1295–1303.

Area of Clearance. Additional tolls are levied in the case of persons passing from one district to another, *Browse* 33–36—— Instances of double tolls in the same parish, or over very short distances, *ib.* 225–229——Relief in particular localities if there were an enlargement of the area of clearance without reference to the existing districts; loss of revenue and difficulty in carrying out such enlargement, *ib.* 334–340. 729–731——Considerable difficulties, though not insurmountable, in the way of an enlargement of the area of clearance, *Lord Lonsdale* 1650.

Ashpitel, Arthur. (Analysis of his Evidence.)—Owns considerable property between the Clapton gate and the Lee Bridge gate, in the parish of Hackney, 1160–1167——Operation of these toll-gates as a prohibition upon the letting of land and the building of wharves, &c.; instance of this in the case of witness, whose land is much depreciated by the tolls, 1168–1178. 1187–1210——Prejudicial effect of the tolls in the Tower Hamlets district upon the property therein, 1179, 1180——Prejudicial effect generally of toll gates upon the property in the neighbourhood, 1180. 1192–1195. 1198. 1200, 1201.

Upon five miles driving in the Hackney, &c., district witness frequently pays four tolls, 1181——Different feeling in Hackney in regard to the maintenance of the roads being thrown upon the parish, 1182–1185. 1215, 1216——Belief as to a reduction of the local omnibus fares if the tolls were abolished, 1186, 1217–1222——The abolition of the tolls would benefit the entire parish, more or less in different localities, 1187–1214——Locality of the Lee Bridge gate adverted to, 1197. 1223.

Association for the Modification of the Metropolis Tolls. Witness is secretary to this association, *Bradfield* 1224——Particulars as to the constitution, object, and operation of the association, *ib.* 1225 *et seq.*——It is composed partly of omnibus proprietors, partly of persons in other trades, and partly of independent gentlemen; names of some of the members, *ib.* 1225. 1237. 1274–1277——The association aims at the total abolition of the tolls, *ib.* 1226, 1227.

Extent to which the association as a body has held meetings of its members, *Bradfield* 1228–1238——No committee or directing body has yet been formed, *ib.* 1228. 1266, 1267. 1272——Action hitherto of the association mainly through witness, who has advanced some money in forwarding its object, and who expects to be duly recompensed for his exertions and his outlay in the matter, *ib.* 1228. 1247–1264. 1272–1274. 1321–1323——The association was not in existence in 1855, and formal subscriptions have not yet been paid by the members, *ib.* 1242–1247. 1259–1261.

Report, 1856—*continued.*

B.

Ball's Pond Gate. Amount of traffic as checked from twelve o'clock, Wednesday night, June 25, to twelve o'clock, Thursday night, June 26, 1856, *App. p.* 119.

Barker, John. (Analysis of his Evidence.)—Jobmaster at Hackney, 1023, 1024——Evidence relative to three lines of omnibuses on the Newington-road; the fare by one line, stopping short of the Kingsland Gate, being 3*d.*, by another line, going beyond the gate, being 4*d.* and by a third line, also passing through the gate to a further distance, being 6*d.*; question as to the increased fare being the result of the toll, 1025–1075.

Bayswater Gate. Removal in 1834 of this tollgate, *Browse* 72, 73.

Bayswater Omnibuses. Use by the Bayswater omnibuses of a portion of the Whitechapel road without paying for it; the omnibus fares have not been reduced in consequence, *Browse* 723–728. 736–744.

Bradfield, John Edwin. (Analysis of his Evidence)—Is secretary to the Association for the Modification of the Metropolitan Tolls, 1224——Particulars as to the constitution, objects, and operation of this association, 1225 *et seq.*——Action hitherto of the association mainly through witness, who has advanced some money in forwarding its objects, and who expects to be duly recompensed for his exertions and his outlay in the matter, 1228. 1247–1264. 1272–1274. 1321–1323——On the present occasion witness appears as the agent of the omnibus proprietors, who are members of the association, 1239, 1240.

Reference to the reports of the Metropolis Roads Commissioners, as showing that one of its chief objects was a reduction of the tolls, 1278——Comments on the circumstance as shown in a return by the Commissioners to Parliament, that as regards the Ninth District, comprising Highgate, Hampstead, and Islington, the tolls have in the last six years produced between 16,000*l.* and 17,000*l.* over and above the expenditure on the roads, 1278–1290. 1313——Inaccuracy of Mr. Browse's evidence as to the loss that would accrue from a removal of the Islington, St. Pancras, and Hampstead-road gates, 1278——Notwithstanding the recent reduction of tolls in the Islington district, there is still no loss on that district, 1291.

Sundry points requiring explanation in the reports of the Commissioners in regard to sums due to them by waterworks companies, 1292, 1293——Matters also requiring explanation in regard to the granite accounts, 1293–1295——Comment on the circumstance that some of the officers of the Commission, Mr. Anderson and Mr. Browse for instance, hold offices in other trusts, 1295–1303.

Evidence in favour of the abolition of the Kensington gate, nearest London, the same being a great inconvenience, whilst it produces but a small amount in tolls; sufficient stock of granite on the road for its repair for two years adverted to hereon, 1304–1313. 1329——Examination in defence of an anonymous communication sent by witness to certain parties in his district, advising them to evade the tolls, 1314–1328.

Suggested representation of the toll payers on the Commission, 1330——The Tower Hamlets and Marylebone should also be represented at the Board, *ib.*——Reasons which till recently induced witness to propose the abolition of the Commission, and the transfer of the trust to the Metropolitan Board of Works under a system of general rate over the metropolitan area, 1331–1339. 1349–1351.

Witness now advocates a special rate upon each parish for the maintenance of its particular amount of road, as more just than a system of general rate, 1336–1354——There should be but one management for the sewers and the roads, 1340–1342——Cheaper maintenance of roads by the Woods and Forests, as in the case of Regent-street, than by the Metropolis Commission, as in the case of the City-road, 1344.

Increase of omnibus accommodation according as the toll-gates are removed further from London; instances of this, 1355–1358. 1364——Reason for the non-reduction of omnibus fares in Islington, &c., when the tolls were reduced, 1359–1363——Respect in which the absence of tolls on the omnibus line from Paddington to the Bank has been advantageous to the public, 1365–1367.

See also *Lines, Augustus* [Second Examination].

Brewers' Drays. Circumstance of brewers' drays, &c. rarely paying tolls though they largely use the roads, *Lord Lonsdale* 1725. 1741–1743.

Bridges. Probable effect of the toll for crossing Waterloo and Southwark bridges in checking the running of more omnibuses, *Lines* 1475–1478. 1483.

Browse, Henry. (Analysis of his Evidence.)—Surveyor to the Metropolis Roads Commission since 1853; has been in the employment of the Commission since 1827, 1–6——The Commission was constituted in 1826 under the Act 7 Geo. 4, c. 142, 7, 8——In 1829 another Act, 10 Geo. 4, c. 59, was passed with a view to equalize the tolls over the several districts, 9-11——In 1826 there were fourteen trusts, comprising about

Report, 1856—*continued.*

Browse, Henry. (Analysis of his Evidence)—*continued.*

130 miles, handed over to the Commissioners, 11–13——The fourteen trusts have been constituted into sixteen districts for the collection of the tolls; these districts explained on the map, 14–29——The Marylebone and Finchley Trust, and the New North-road Trust, are also under the care of the Commissioners, but the parishes repair the roads, 30–32.

Additional tolls are levied in the case of persons passing from one district to another, 33–36——The tolls of each district are applied to the reduction of the general debt, there not being a separate account of receipt and expenditure for each trust, 37. 158–162——Bad state of the roads in 1826, 38–40. 206, 207——The debt upon the trust then amounted to 150,000 *l.*, 41, 42——The debt has since been paid off, 43, 44——The roads are now in a good condition, and are to a great extent repaired with granite, 45. 205–209——Repair of the road from London to Edgeware, and London to Harrow, out of Lyon's estate and the Harvist estate, separate accounts being kept as regards those roads, 46–55. 160.

Particulars as to about fifteen miles having been given up by the Commissioners to the parishes, leaving 121 miles under the care of the former, 56–66. 71. 77–79——Discontinuance since the Act of 10 Geo. 4, of the collection of a rate for lighting and watching, 63–66——Effect of the construction of railways upon the roads and upon the action of the Commission, 67–70. 130–132——Statement of the several removals of toll-gates down to the year 1847, since which period no material alteration has taken place, 70–81.

Diminution in income and increase in the cost of repairs which have prevented any further removals of toll-gates to greater distances from London, 82–119. 314–320——Increased traffic and cost of repair in regard to those portions of road within the gates on the London side, from which the toll has been removed, 82–89. 165–174——Great wear through omnibuses which generally stop at the gates as their limit, 82–89. 166–169. 197–199——Amount received from tolls and trust property respectively, in the year 1827–28, and in 1855–56; decrease of about 11,000 *l.*; 90–103——Reference to the establishment expenses in 1855–56 as amounting to 3,695 *l.* (particulars hereon promised), 104–109——Investment during the last year of 10,263 *l.* in Exchequer Bills, adverted to, 110–112.

Surplus receipts of about 5,000 *l.* in the last four years, 113——Reduction in 1855, at a cost of about 4,500 *l.*, of the tolls in the Hampstead and Highgate Trust, in the Islington district; the gates could not be removed without great loss, 113. 175–177. 270. 281–286——Estimate income, during the current year, of 64,950 *l.*, and estimated expenditure of 64,945 *l.*; 118, 119. 240–242——Advantage in letting the tolls whenever it can be done, 120, 121——Increase of side-bars in order to prevent evasion of the tolls; how far effectual, 122–127——Doubt as to any increase of buildings and population where the gates have been removed, 128, 129. 187–191——Debt in the case of the Kilburn and Edgeware-road Trust, 133–137——Debt also upon the Harrow-road Trust, when handed over to the Commissioners; there is still a toll-gate on this road, 138–142.

Statement showing the commencement and termination of the roads comprised in each of the sixteen districts under the control of the Commission, 143–154——Discontinuance since 1838, or rather since 1836, of receipts under the head of Statute-labour, 155–157——Statement of the length and cost of the metropolis roads within the limits of the Metropolis Local Management Act, together with the amount of assessment to the poor and the rate in the pound, for the purpose of repairs, &c., 163, 164, and *App. p.* 110, 111——On the London side of the gates, eleven miles and five furlongs have been given up by the Commissioners, the repairs on which, costing about 15,700 *l.*, are defrayed out of the tolls levied beyond the gates, 165–174. 178–186.

Tolerably good state of the roads handed over to Chelsea parish, 192——In 1828, there were 45 toll-gates, there are now thirty-six; 193, 194——There are now 81 side-bars, whilst in 1828 there were only forty-five, 193–196——Considerable wear and tear through the coal traffic as conveyed on narrow-wheel waggons, 199–203——Probable increase of expense and deterioration of the roads if they were entirely handed over to the several parishes, 210–220. 267. 273–280. 288–291. 299. 306, 307——Inference as to the unwillingness of the parishes generally to undertake the maintenance of the roads, 221–224. 270–272.

Instances of double tolls in the same parish or over short distances, 225–229——Increase of accommodation generally as well as of omnibus traffic if the gates were removed altogether, 230–237. 250–255——Expenditure in regard to improvements, such as widening and straightening the roads, 438–247——Doubt as to the expediency of a highway rate in lieu of tolls, 248–255. 268, 269——A statement of the receipts and expenditure on account of the several districts, as let together, can be provided for the Committee, 256–266——Mode and cost of repair of Regent-street, 275–280. 288–290.

Report, 1856—*continued.*

Browse, Henry. (Analysis of his Evidence)—*continued.*

Alteration in 1849 in the position of some of the gates on the Kingston-road as well as in the management of a portion of the road which was transferred to the parishes, 291–312——The highest amount received by the Commissioners from tolls in any year was 83,497 *l.* in 1837; 313——Increase of expenditure as the traffic or the income increases, 314——Witness does not see how there can be any reduction in the cost of keeping up the roads, or in the tolls, 318–320.

[Second examination.]—Considerable extent to which evasion of the toll-gates is practised, 321–324. 341–350——Unequal operation of the gate at Kensington in its not being at the commencement of the trust; the question of evasion, however, does not apply, 325–331——Effect of a toll-gate upon the value of house property on either side of it, 332——Relief in particular localities if there were an enlargement of the area of clearance without reference to the existing districts; loss of revenue and difficulty in carrying out such enlargement, 334–340.

Greater equality in throwing the roads into the management of the Metropolitan Board of Works than into the hands of the district Boards, 352–358. 372–375——Inequality in the Hackney and all other districts where the gate is not at the end of the trust, 359, 360——The roads are watered by contract, 361. 395——Out of 120 miles of road, 102 miles are watered, 362, 363——Reference to the circumstance of a portion of the roads in Upper Clapton having for three or four years been watered at the expense of the inhabitants, 364–371.

Great outlay in watering during the five years since the debt of the Commissioners has been paid off, 368. 384——Mileage under the Commissioners, in the parish of St. Margaret's and St. John's, 373–375——Those portions of the districts which are not watered pay towards the watering of the other portions, 376, 377——Increased expense since 1852 in cleansing the roads, 378, 379——Expense of 850 *l.* a year still incurred by the Commissioners in regard to about a mile of road in the parish of Chelsea, 380–383——Cost of 2,400 *l.* in 1854 for repairing with granite, 385——Yearly outlay of 4,800 *l.* in improvements since the extinction of the debt, 386——Circumstance of the New River Company charging an increased price on account of their water being now filtered, 387–394.

Light in which any of the trusts can be said to be in debt, 396, 397——Rate of tolls and position of the gates on the Surrey and Sussex roads, near the metropolis, as compared with the roads under the Commissioners, 398–412——Estimated loss of receipts from the Hampstead and Highgate trust if the three gates nearest London were abolished, 413–424——Increased wear and tear and cost of outlay over those portions of road freed by the removal further back of the gates, 425–428——Inadequacy of the trust property in regard to the Harrow-road to meet the cost of repairs which amount to about 2,300 *l.* a year, 429–433.

[Third Examination.]—The total removal of the Hampstead and St. Pancras gates would constitute a loss of about 2,500 *l.* a year; how calculated, 679–689——The loss of removing the Islington gate would be about 3,500 *l.*; 680——The abolition of the Notting-hill gate is estimated at 1,600 *l.*; 690——The Harrow gate is now let for 1,110 *l.*; 691, 692——The Kilburn and Edgeware districts are let for 3,300 *l.*; 693——Means of furnishing the amounts collected at the several gates, 694–696. 732.

Practice in regard to the payment of the toll by omnibuses; they rarely stop at the gate on purpose, 703–705——Estimated total receipt of 26,000 *l.* a year, or nearly one-half of the whole, from omnibuses; remarks hereon, 706–710. 733–735. 743, 744——Out of about 3,600 *l.* a year received from the Harrow-road trust a certain portion is paid to the parishes of Paddington and Maryiebone, and the remainder is allocated to the Harrow and Edgeware roads; 711–715——Extent to which there may be hardship on the public as regards the Clapton and Lee Bridge gates, 717–722.

Use by the Bayswater omnibuses of a portion of the Whitechapel-road without paying for it; the omnibus fares have not been reduced in consequence, 723–728. 736–744——Further opinion as to the fraud and loss of income that would ensue if, in certain cases, the area of clearance were enlarged, 729–731——Belief that there has been no reduction of omnibus fares in consequence of reduction or abolition of tolls, 738–744——The loss of the tolls in the City-road district would be 2,800 *l.* a year, 745–748——The Islington district let last year for 14,500 *l.*; there is a balance in this case in favour of cash, 749–752.

[Fourth Examination.] The average annual receipt of tolls for the five years ending 1835, was 78,138 *l.*; for the ten years ending 1845, was 72,380 *l.*; and for the ten years ending 1855 was 64,695 *l.*; 1153–1159.

See also *Lyon, James Wittit.* *Wright, Vincent Charles.*

Report, 1856—*continued.*

C.

Cambridge Heath Gate. Amount of traffic as checked from 12 o'clock, Wednesday night June 25, to 12 o'clock, Thursday night, June 26, 1856, *App. p.* 115.

Chalk Farm Gate. Traffic check from 12 o'clock Wednesday night, June 25, to 12 o'clock, Thursday night, June 26, 1856, *App. p.* 116.

Chelsea. Statement as to the roads in Chelsea parish having been given up to the parish, at its own application, under an Act passed in 1845, *Browse* 71. 77–79; *Lord Lonsdale* 1638–1648——Expense of 850 *l.* a year still incurred by the Commissioners in regard to about a mile of road in the parish, *Browse* 380–383.

The toll-gates in the parish were removed by Act in August 1845, *Pattisson* 781——Examination as to the increase of rate consequent on the transfer, *ib.* 784 *et seq.*; 853 *et seq.*——Out of the improvement rate of 1 *s.* 6 *d.* under the Act of 1845, 6 *d.* is allocated to the highways; particulars hereon, *ib.* 784, 785. 790. 848, 845. 858–862——The roads are altogether 23 miles in length, including about 2¾ miles formerly repaired by the Metropolis Commissioners, *ib.* 792–795. 847.

Satisfaction of the inhabitants as regards the removal of the toll-gate, and all the other improvements under the Act of 1845, *Pattisson* 797, 798. 816–823. 832, 833——Statement as to a small portion of the road in the parish as still repaired at the expense of the Commissioners, *ib.* 799–806. 844——Increase of omnibuses through the parish, and reduction of fares since 1845; probable reason, *ib.* 824–827. 841–843. 845, 846——Poor-rate assessment of 201,196 *l.* in 1855, upon which the highway rate of 6 *d.* in the pound is levied, *ib.* 848, 849.

Average sum of 300 *l.* per mile, or 6,800 *l.* altogether, put down by the vestry of the parish as the cost of paving materials, cartage, labour and watering, *Pattisson* 854–859. 879–885——Discrepancy adverted to as between the total cost of 6,800 *l.* and the allocation of 6 *d.* in the pound on 201,196 *l.*; *ib.* 858–862. 879——Probable increase of staff when the two miles and three quarters of metropolis roads were transferred to the parish, and the Improvement Act passed, *ib.* 872, 873.

Further evidence as to the produce of the rate of 6 *d.* in the pound and the total cost of 6,800 *l.*; the poor assessment as regards Hans Town, namely 48,000 *l.*, was not included in the assessment of 201,196 *l.*; *Pattisson* 1076–1081. 1119–1122——Further evidence as to the increase of rates since the passing of the Improvement Act, *ib.* 1082 *et seq.*——Increase consequent upon the necessity of raising money to pay off 30,000 *l.* borrowed under the Improvement Act, *ib.* 1082, 1083. 1088.

Previously to 1845 the rates for paving, lighting, &c., were 1 *s.* 3½ *d.* in the pound; subsequently they were 1 *s.* 6 *d.*, *Pattisson* 1082. 1095–1101——Effects of the Metropolis Local Management Act in keeping up the rates, *ib.* 1083–1094——Present highway rate of 10 *d.* in the pound in the Improvement Commissioners' district, *ib.* 1087, 1088——Mode of keeping the accounts in regard to the expenditure on paving, sewerage, &c., *ib.* 1135–1152.

See also *Hans Town District.* *State of the Roads.*

City Road. The cost of repairs, &c., per mile is 2,300 *l.*, *Browse* 277——Loss of about 3,000 *l.* a year if the City-road toll-gate were abolished, *Wright & Browse* 547. 549——Cost of 5 *l.* or 6 *l.* a week in keeping up the side-bars, *Wright* 548——The Commissioners are not in a position to repair the City-road without any receipt therefrom, *Browse* 553, 554——The loss of the tolls in the City-road district would be 2,800 *l.* a year, *ib.* 745–748.

Particulars as to the traffic which passed through the City-road gate from 12 o'clock on Friday night till 12 o'clock on Saturday night, the 21st June; total of 3,362 vehicles and 80 saddle-horses, *Gill* 1015——Amount of traffic through the gate from 12 o'clock Friday night, June 27, to 12 o'clock Saturday night, June 28, 1856, *App. p.* 115.

Clapton and Lee Bridge Gates. Extent to which there may be hardship on the public as regards the Clapton and Lee Bridge gates, *Browse* 717–722——Operation of these gates as a prohibition upon the letting of land and the building of wharves, &c.; instance of this in the case of witness, whose land is much depreciated thereby, *Ashpitel* 1168–1178. 1187–1210——Locality of the Lee Bridge gate adverted to, *ib.* 1197. 1223.

Coal Traffic. Considerable wear and tear through the coal traffic as conveyed on narrow-wheel waggons, *Browse* 199–203——Reference to the heavy toll upon narrow-wheel coal waggons, as being, though to a limited extent, a tax upon coals, *Lord Lonsdale* 1728–1731.

Collection of Tolls. System of net payment by the toll collectors to the superintendent, the cost of wages, &c., being first deducted, *Wright* 471. 476–478——Check through a superintendent, and occasionally through means of a system of *espionage* upon the honesty

Report, 1856—*continued.*

Collection of Tolls—continued.

of the collectors, *Wright* 479–483. 495–500. 503, 504; *Browse* 500–505——Defect in the system of tolls on account of the wasteful expenditure incurred in collection, &c., *Neild* 669.

Commercial Traffic. The railway vans and commercial traffic pay about 12,000 *l.* a year in tolls, *Lord Lonsdale* 1653. 1660. 1708.

Contracts. Practice in regard to contracts for materials; acceptance almost invariably of the lowest tender, *Lord Lonsdale* 1608–1610——List of persons who last tendered for granite, flints, gravel, slopping, cartage and watering, *Browse* 1645, 1646.

Cost of Maintenance. Increased traffic and cost of repair in regard to those portions of road within the gates on the London side from which the toll has been removed, *Browse* 82–89. 165–174——Statement of the length and estimated cost of the metropolis roads within the limits of the Metropolis Management Act, together with the amount of assessments to the poor, and the rate in the pound, for the purposes of repairs, &c., *Browse* 163, 164; and *App. p.* 110, 111——Witness does not see how there can be any reduction in the cost of keeping up the roads or in the tolls, *Browse* 318–320——Advantages of the Metropolis Commission over the individual parishes in regard to the watering and the supply of granite, &c., *Wright* 491–497.

Expediency on the whole of a mixed system, that is, of maintaining all leading thoroughfares by means of tolls, and all intermediate communications by parish rates, *Neild* 669–674.

See also *Chelsea. Parishes. Rate. Toll-gates.*

County Rate. Objection to the cost of the metropolis roads being thrown upon the county, *Neild* 668——Inequality if there were a county highway rate to embrace the maintenance of the metropolis roads, *Lord Lonsdale* 1536, 1537. 1576, 1577.

D.

Debt. The debt upon the trust in 1826 amounted to 150,000 *l.*, *Browse* 41, 42——It has since been paid off, *ib.* 43, 44——Annual rate at which the debt was redeemed; the lowest appropriation yearly was 2,500 *l.*, *ib.* 113–115——Light in which any of the trusts can now be said to be in debt, *ib.* 396, 397.

Payment by the Commissioners of four per cent. interest on a loan contracted to pay off debts handed over to them upon which a much higher rate of interest was paid, *Wright* 467, 468——Where the trusts have been thrown upon the parishes there was scarcely any debt, or none at all, *Lord Lonsdale* 1530.

Districts. The fourteen trusts under the Commission have been constituted into sixteen districts for the collection of tolls; these districts explained on the map, *Browse* 14–29——Statement showing the commencement and termination of the roads comprised in each of the sixteen districts, *ib.* 143–154——In dealing with any district the Commissioners have not acted so as to pay off the debt in that particular case, but have dealt with the several districts as a whole, *Lord Lonsdale* 1531–1533. 1572–1574.

Drainage. Expenditure upon the roads in deep drainage which has completely answered, *Lord Lonsdale* 1511.

E.

Edinburgh. Reference to the system in Edinburgh whereby the roads inside the gates are thrown upon the parishes, *Lord Lonsdale* 1540. 1675–1677.

Edgware Road. See *Kilburn and Edgware Road Trust. Lyon Estate and Harvist Estate.*

Equalisation of Tolls. In 1829 the Act 10 Geo. 4, c. 59, was passed, and the tolls over the several districts were equalised thereby, *Browse* 9–11; *Lord Lonsdale* 1578–1584.

Establishment of Metropolis Roads Commission. Reference to the establishment expenses in 1855-56 as amounting to 3,695 *l.*, *Browse* 104–109——Comment on the circumstance that some of the officers of the Commission, Mr. Anderson and Mr. Browse, for instance, hold offices in other trusts, *Bradfield* 1295–1303—— Cheap and effectual character of the official establishment of the Commission, *Lord Lonsdale* 1604–1607—— Reason for some of the officers of the Commission holding other appointments, *ib.* 1773.

Evasion of Tolls. Considerable extent to which the toll-gates are evaded, *Browse* 321–324. 341–350.

Examination in defence of an anonymous communication sent by witness to certain parties in his district, advising them to evade the tolls, *Bradfield* 1314–1328.

Expenditure. See *Income and Expenditure.*

Report, 1856—*continued.*

F.

Fawcett, James. (Analysis of his Evidence).—Was employed by Mr. Bradfield to take the traffic that passed through Regent-street from twelve o'clock on Friday night till twelve o'clock on Saturday night, the 21st June, 1001, 1002. 1006–1012——Particulars of this traffic; total of 10,339 vehicles and 196 saddle-horses, 1003 1005.

Finance Committee. Minute monthly inspection of the accounts by the finance committee of the Commissioners, *Wright* 533-542.

G.

Gell, Rev. John Philip. (Analysis of his Evidence).—Incumbent of St. John's, Notting-hill, 555——Injurious effect of the Notting-hill turnpike gate upon the population of the district, on account of the additional public-houses to meet the traffic stopping at the gate, 557. 569, 570, 579, 580——More equal distribution of the public-houses if the gate were removed, 557. 571——Injurious effect of the gate upon the house property on the western side of it, 557-568——Witness is not prepared to state that the parish is willing to take charge of the road, or to suggest any means of repairing the road, save through the tolls, 573-582.

George's, St., Parish, Hanover-square. Payments by the Commissioners to the parish of St. George's in respect of the repair of Piccadilly, *Lord Lonsdale* 1549-1551.

Gill, Henry. (Analysis of his Evidence).—Was employed by Mr. Bradfield to take the traffic which passed through the City-road from twelve o'clock on Friday night till twelve o'clock on Saturday night, the 21st June, 1013, 1014. 1016–1022——Particulars as to this traffic; aggregate of 3,362 vehicles and 80 saddle-horses, 1015.

Granite. Cost of 2,400 *l.* in 1854 for repairing the metropolis roads with granite, *Browse* 385——Repairs of the Chelsea parish roads with granite; how procured and prepared; cost thereof, *Pattisson* 828-831. 834-840. 850-852——Matters requiring explanation in regard to the granite accounts of the Commission, *Bradfield* 1293-1295.

Applications from omnibus proprietors and others for paving with granite, *Lord Lonsdale* 1592. 1596–1601. 1664——In 1827 there was but one mile, whereas there are now 50 miles paved with granite, *ib.* 1593, 1594——Less price of granite as procured by the Commission than as procured by Chelsea parish, *ib.* 1611–1619.

Several contractors tender for the supply of granite, *Lord Lonsdale* 1643——List of persons who tendered for the last supply, distinguishing the accepted and the non-accepted tenders, *Browse* 1645, 1646.

Gravel. List of contractors who tendered for the last supply, *Browse* 1645.

H.

Hackney. Application in 1855 from the parish of Hackney for the removal of the gates and the reduction of the tolls, *Browse* 222. 270——Inconvenience of the gates to the inhabitants, *ib.* 225——Inequality in the Hackney and all other districts where the gate is not at the end of the trust, *ib.* 359, 360.

Upon five miles driving in the Hackney, &c., district, witness frequently pays four tolls, *Ashpitel* 1181——Different feeling in Hackney in regard to the maintenance of the roads being thrown upon the parish, *ib.* 1182–1185. 1215, 1216——Belief as to a reduction of the local omnibus fares if the tolls were abolished, *ib.* 1186. 1217-1222——The abolition of the tolls would benefit the entire parish, more or less in different localities, *ib.* 1187–1214——There is one gate at the extreme east end, one at the extreme west end, and one in the north of the parish, *ib.* 1197. 1211–1213.

See also *Clapton and Lee Bridge Gates.*

Hammersmith. Question as to any grievance to Hammersmith if the Kensington gates were removed, and the cost of keeping up the Hammersmith roads transferred to the parish, *Neild* 619–621. 641–645. 654–1666——Improvement to Notting-hill and injury to Hammersmith if the gates at the former place were removed to the latter, *Lord Lonsdale* 1761–1763.

Hampstead Road Gate. Traffic check from 12 o'clock, Wednesday night, June 25, to 12 o'clock, Thursday night, June 26, 1856, *App. p.* 117.

See also *Islington, Hampstead, and Highgate.*

Hampstead and St. Pancras Gates. The total revenue of the Hampstead and St. Pancras gates would constitute a loss of about 2,500 *l.* a year; how calculated, *Browse* 679-689.

Hans Town District, Chelsea. Increase as regards the Hans Town District of from 6 *d.* to to 9 *d.* in the lighting and paving, &c., rate for 1856 as compared with 1855; causes assigned, *Pattisson* 1088–1094. 1106–1118. 1123-1152.

Report, 1856—*continued.*

Harrow Road. Reduction in 1847 of the toll from 3 *d.* to 2 *d.*, and removal at the same time of the toll-gate so as to exempt a mile of road, *Browse* 72——Debt upon the Harroad Trust when handed over to the Commissioners; there is still a toll-gate on the road, *ib.* 138–142——Inadequacy of the trust property to meet the cost of repairs, which amount to about 2,300 *l.* a year, *ib.* 429–433.

The Commissioners have spent 4,614 *l.* in improving the Harrow-road; it much required improvement, *Browse* 443–449——About a mile of the road is in the parish of Paddington, *ib.* 450——The Harrow gate is now let for 1,110 *l.*, *ib.* 691,692.

See also *Lyon Estate and Harvist Estate.*

Harvist Estate. See *Lyon Estate and Harvist Estate.*

Highgate. See *Islington, Hampstead, and Highgate.*

Horse Tax. Question as to the practicability of a tax on each horse in Middlesex as a means of repairing the roads and abolishing the tolls, *Lord Lonsdale* 1653–1657. 1754–1757.

I.

Improvements. Expenditure in regard to improvements, such as widening and straightening the roads, *Browse* 238–247——The total expenditure on new roads and improvements has been, 59,780 *l.*; *ib.* 239——Average yearly outlay of 4,800 *l.* in improvements since the extinction of the debt, *ib.* 386.

Considerable expenditure in improvements under the head of repairs, *Lord Lonsdale* 1511. 1620——Falling off in the income of the Commissioners adverted to as preventing improvements and concessions, *ib.* 1626–1629. 1665–1674.

See also *Drainage. Granite. State of the Roads.*

Islington, Hampstead, and Highgate. Reduction in 1855, at a cost of about 4,500 *l.* of the tolls on the Hampstead and Highgate Trust, on the Islington district; the gates could not be removed without great loss, *Browse* 113–117. 270. 281–286——Estimated loss of receipts from the Hampstead and Highgate Trust, if the three gates nearest London were abolished, *ib.* 413–424——The loss of removing the Islington gate would be about 3,500 *l.* a year, *ib.* 680——The Islington district let last year for 14,500 *l.*; there is a balance in this case in favour of cash, *ib.* 749–752.

Comments on the circumstance, as shown in a return by the Commissioners to Parliament, that as regards the Ninth District, comprising Highgate, Hampstead, and Islington, the tolls have in the last six years produced between 16,000 *l.* and 17,000 *l.* over and above the expenditure on the roads, *Bradfield* 1278–1290. 1313——Inaccuracy of Mr. Browse's evidence as to the loss that would accrue from a removal of the Islington, St. Pancras, and Hampstead-road gates, *ib.* 1278——Notwithstanding the recent reduction of tolls in the Islington district, there is still no loss on that district, *ib.* 1291——In fact, the Commissioners owe money to the Ninth District, and ought to pay it in some shape or other, *ib.* 1313. 1389.

Amount of traffic through the Islington gate, as checked from twelve o'clock, Wednesday night, June 25, to twelve o'clock, Thursday night, June 26, 1856, *App. p.* 116.

K.

Kensington. There are two districts and two separate toll-gates in the parish, *Browse* 227–229——Unequal operation of one of the gates at Kensington in its not being at the commencement of the trust; the question of evasion does not apply, *ib.* 325–331.

Considerable hardships upon the inhabitants of Kensington in their being liable to one or two tolls in passing from one part of the parish to another, *Neild* 585–592. 621–627. 632. 634, 635——Unwillingness of Kensington parish to undertake the maintenance of the two main lines of road leading from the west country to London; propriety of the objection, *ib.* 597. 601–618. 638. 657. 663——Opinion that the parish would not and ought not to object to the maintenance of the intercommunication lines, exclusive of the main arteries, *ib.* 597–601. 658–665. 675——When main roads become streets, and form part of a town, their expense should be borne by the parishes; belief that this rule does not apply to Kensington, *ib.* 601–618. 665–667. 674.

Evidence in favour of the abolition of the Kensington gate, nearest London, the same being a great inconvenience whilst it produces but a small amount of tolls; sufficient stock of granite on the road for its repair for two years adverted to hereon, *Bradfield* 1304–1313. 1329——Special reasons for the removal of the gate, *ib.* 1424. 1496. 1498, 1499.

Intention

Report, 1856—*continued.*

Kensington—continued.

Intention of the Commissioners to open Addison-road so as to afford relief to the people of Kensington, *Lord Lonsdale* 1650——Explanation as to the heap of granite on the Kensington-road; it will be used by Christmas, *ib.* 1713–1716.

See also *Hammersmith.*

Kentish Town. Anticipated reduction of omnibus fares in the Hampstead and Kentish Town districts if the tolls were removed, *Bradfield* 1388. 1391.

Kentish Town Gate. Traffic check from 12 o'clock Friday night, June 27, to 12 o'clock Saturday night, June 28, 1856, *App. p.* 117.

Kilburn and Edgware Road Trust. Debt in the case of the Kilburn and Edgware-road trust, *Browse* 133–137——The Kilburn and Edgware districts are let for 3,300 *l.*; *ib.* 623.

King's Cross Omnibuses. The King's-cross line of omnibuses does not pay any toll; the toll-gate being avoided in their route, *Lines* 893, 894. 945. 961.

King's Cross Gate. The King's-cross gate might very easily be avoided altogether, *Lines* 943.

King's Road. Benefit to Chelsea and Brompton by the removal of the toll-gate in the King's-road, *Bradfield* 1357, 1358. 1386.

Kingsland. Discontinuance in 1846 of the Kingsland-road gate, whereby a mile and a quarter of road were freed from toll, *Browse* 71, 72——Less omnibus fare from Kingsland than from Hackney to London, there being no toll in the former case, *Lines* 1479–1481.

Kingston Road. Alteration in 1849 in the position of some of the gates on the Kingston-road as well as in the management of a portion of the road which was transferred to the parishes, *Browse* 291–312.

L.

Lee Bridge Gate. See *Clapton and Lee Bridge Gates.*

Letting of Tolls. Advantage of letting the tolls whenever it can be done, *Browse* 120, 121.

Lighting. See *Watching and Lighting.*

Lines, Augustus. (Analysis of his Evidence.)—Is an omnibus proprietor and one of the district managers of the London General Omnibus Company, 886–888——Statement relative to five lines of omnibuses, namely, the Waterloo, the King's Cross, the Camden-town, the Kentish-town and Highgate, and the Hampstead, all of which pass through the same district, and would, if the toll-gate at Mornington-crescent were removed, pay the same tolls as at present, with the exception of 4 *l.* a week, 889–913. 949–974——There are about seventy-nine omnibus on these five lines, 889. 900——Payment by the Camden-town omnibuses of 4 *l.* a week as a composition for passing through the Mornington-gate, which by a short circuit they could avoid altogether; the full toll would amount to 56 *l.* a week, 896. 901, 902. 906–909, 933, 934.

Consideration of the fares paid by the public on the several lines in question; inference that the tolls do not operate in keeping up the fares, 914–948. 975 *et seq.*——Extensive evasion generally of the Mornington-crescent gate, 946——Impracticability of preventing the evasion by means of side bars, 947——Examination to the effect that the absence of tolls does not reduce the cost of travelling by omnibus or increase the profits of the omnibus proprietors, but conduces considerably to public convenience by enlarged means of communication, 948. 975–992——Doubt as to the rate per omnibus or per mile which the tolls amount to; it would not be more than five per cent. on the total maintenance of the omnibus, 989–1000.

[Second Examination.]—Three different sections and three rates of fare into which the line of omnibuses from Paddington to the Bank is divided, 1368–1384.

(*Mr. Bradfield.*)—The advantage of an abolition of the existing tolls is not applicable in the case of the Paddington omnibuses, 1385——Generally, the abolition of the tolls would lead rather to increased accommodation than to a reduction of fares, though in some instances reductions would most probably be made, 1386–1414——Gain to Government if the tolls be abolished and the omnibus mileage duty increased, 1406——Respect in which the reduction of the mileage duty was beneficial to the public, 1407–1411——Proportion of the toll to the receipts of each omnibus; average number of passengers adverted to hereon, 1415–1423.

Witness further advocates the entire removal of the toll-gates and the management of the roads by the Metropolitan Board of Works, each parish being rated for its own roads instesd of contributing to a general rate, 1424–1435. 1495–1502——Special reasons for

Report, 1856—*continued.*

Lines, Augustus. (Analysis of his Evidence)—*continued.*

the removal of the Kensington gate, 1424. 1496. 1498, 1499——Belief that there are now less than sixteen different omnibus companies or proprietors in London, 1436–1446.

(*Mr. Lines.*)—Statement to the effect that there are but two companies in London, the Richmond and the London General Omnibus Company, 1447–1452——The General Omnibus Company has bought up the interest of rather more than half the trade, 1447. 1452——System of association of proprietors in certain districts for the prevention of competition and the settling of fares, &c., independently of the general company, 1447. 1456–1472——Benefit to the proprietors in the abolition of the tolls, 1453, 1454.

The district fares are regulated more by the amount of population in the district than by competition or tolls, 1455——Effect of the tolls in lessening the distances run and consequently the accommodation, 1455. 1482——Probable effect of the toll for crossing Waterloo and Southwark Bridges in checking the running of more omnibuses, 1475–1478. 1483——Less fare from Kingsland than from Hackney to London; there being no toll in the former case, 1479–1481——Prejudice to public accommodation if the omnibus business be unduly interfered with, 1484–1487——Opportunity for competition in the event of exorbitant fares by the existing omnibus interest, 1488–1493.

London General Omnibus Company. The General Omnibus Company has bought up the interest of rather more than half the trade, *Lines* 1447–1452.

Lonsdale, Right Hon. the Earl of. (Analysis of his Evidence).—Has been Chairman of the Metropolis Roads Commission since its commencement, 1503–1506——Introduced into the House of Commons in 1827, the Bill under which the Commission was constituted, 1503–1505——The Commission comprised several of the metropolitan Members, and certain practical persons conversant with the matter to be dealt with, 1507. 1723–1727——The roads were at the time in a most defective state, 1508.

There has since been a large expenditure upon the roads, and they have been put in complete repair, 1509, 1510——Surplus balance of about 8,000 *l.* now in the hands of the Commissioners, a debt of 150,000 *l.* having been wiped off, 1509–1511——Considerable expenditure in improvements under the head of repairs, 1511. 1620——Expenditure in deep drainage which has completely answered, 1511——Constant care and attention devoted by witness (who is unpaid) to the business of the Commission, 1512, 1513.

With regard to the operations of the Commission since 1831, witness refers to several toll-gates as having been removed further from London since that year, 1514——The successful objection in 1830 by the parish of St. Luke's to bear any portion of the expense of the City-road, and the anticipated objection of Parliament to sanction the transfer of the roads to the parishes have prevented the Commissioners from taking further steps in that direction, 1515–1525. 1564–1571.

Large expenditure at present by the Commission on parish roads within the gates, 1526, 1527——Impracticability of any removal of the gates further from London on account of the great loss of revenue thereby, 1528, 1529. 1630——Where the trusts have been thrown upon the parishes there was scarcely any debt, or none at all, 1530——In dealing with any district, the Commissioners have not acted so as to pay off the debt in that particular case, but have dealt with the several districts as a whole, 1531–1533. 1572–1574.

Loss of from 15,000 *l.* to 17,000 *l.* a year if the gates were removed another half or three quarters of a mile from London; similar increase if they resumed their former positions, 1534. 1561–1563. 1586–1588——If the tolls be abolished, the only alternative would seem to be to throw the expense on the parishes, 1535. 1561——Inequality if there were a county highway rate to embrace the maintenance of the metropolis roads, 1536, 1537. 1576, 1577——Sundry obstacles in the way of a transfer of the roads, within the metropolitan area, to the parishes through which they run, so that such parishes as Marylebone, St. Pancras, &c., should pay for their own roads; inequality and undue expense to several parishes thereby, 1538 *et seq.* 1742, 1743.

Payment by the Commission to the parish of St. George's, Hanover-square, in respect of the repair of Piccadilly, 1549–1551——Under the Consolidation Act of 1827, there was a great variety of tolls; but with some exceptions, the tolls were assimilated by the Act of 1829; 1578–1584——Low scale of tolls now charged by the Commissioners, 1580——Reference to omnibuses and railway vans as causing considerable wear to the roads, 1589, 1590. 1595. 1663.

Inference that the toll-gates are not an unequal mode of covering the cost of the roads, inasmuch as the parishes do not wish for their removal, 1591, 1592——The pleasure traffic pays the smallest proportion of the tolls, 1592. 1653. 1708, 1709. 1735–1737——The omnibus interest have only recently objected to the tolls, 1592——Applications from omnibus proprietors and others for paving with granite, 1592. 1596–1601. 1664——In 1827 there was but one mile, whereas there are now fifty miles paved with granite, 1593,

1594

Report, 1856—*continued.*

Lonsdale, Right Hon. the Earl of. Analysis of his Evidence)—*continued.*

1594——Great boon to the omnibus interest if the tolls be abolished, 1602, 1603. 1658–1662. 1708–1712.

Cheap and efficient character of the official establishment of the Commission, 1604–1607——Practice in regard to contracts for materials; acceptance almost invariably of the lowest tender, 1608–1610——Less price of granite as procured by the Commission than as procured by Chelsea parish, 1611–1619——Anticipated reduction in the price of contract materials, 1621, 1622——Willingness of the Commissioners to reduce or remove the tolls as much as possible, or to transfer the roads to the parishes, if placed in a position so to do, 1623–1625. 1682, 1683. 1764–1768.

Falling off in the income of the Commissioners adverted to as preventing improvements and concessions, 1626–1629. 1665–1674——Advantage if the entire district within the gates would consent to a small uniform rate for maintaining the roads, 1631–1637——Voluntary action of the Chelsea parochial authorities in regard to the repair of that portion of their roads formerly under the Commissioners, 1638–1642——Several contractors tender for the supply of granite, 1643. (*Mr. Browse.*) Reads a list of those who last tendered for granite, flints, gravel, slopping, cartage, and watering, &c., 1645, 1646.

(*Lord Lonsdale*). Inequality in a system of uniform rate over the district through which the roads run, 1647–1649. 1689–1696. 1752, 1753——Considerable difficulties, though not insurmountable, in the way of any enlargement of the area of clearance, 1650——Intention of the Commissioners to open Addison-road so as to afford some relief to the people of Kensington, *ib.*——Question as to the practicability of a tax on each horse in Middlesex as a means of repairing the roads and abolishing the tolls, 1653–1657. 1754–1757.

Estimate of from 22,000*l.* to 23,000*l.* as now received in tolls from omnibuses, 1653. 1658–1662. 1708——The railway vans and commercial traffic pay about 12,000*l.* a year, 1653. 1660. 1708——The agricultural traffic amounts to 12,000*l.*; 1653. 1660. 1708——Effects of railways in reducing the receipts from tolls, 1666–1669——Further evidence on the question of throwing that portion of the roads within the gates upon the parishes; difficulties therein, 1675 *et seq.*——Difficulty, seemingly, under any other system than the present, 1675–1696.

Doubt as to the omnibus traffic being limited by the tollgates, 1680, 1681——Inequality of a uniform rate over the area under the Metropolis Local Management Act, 1690–1696——Few representations from the omnibus interest or the public for the removal of the gates, 1697–1704. 1710, 1711——Income in 1855–56 of 65,000*l.* from tolls and trust money, 1705–1707——Explanation as to the heap of granite on the Kensington-road; it will be used by Christmas, 1713–1716——Propriety, if practicable without injustice, of throwing the expense of their own roads upon the suburban parishes within the gates, 1717–1722. 1741–1751.

Circumstance of brewers' drays, &c., rarely paying tolls, though they largely use the roads, 1725. 1741–1743——Reference to the heavy toll upon narrow-wheel coal waggons as being, though to a limited extent, a tax upon coals, 1728–1731——Natural objection of omnibuses to bad roads and to the tolls, inasmuch as they are the great conveyers of the public, 1732–1740——Benefit through Lyon's trust, which at present is not increasing, to the parishes of Paddington and Marylebone, 1745–1748——Question as to the propriety of a uniform district rate, according to individual estimates from the parishes, each parish being allowed to expend its own proportion upon its roads, 1749–1753.

Effect upon the gates in deteriorating the property in the neighbourhood, 1758–1763 Improvement to Notting-hill and injury to Hammersmith, if the gates at the former place were removed to the latter, 1761–1763——Witness does not consider that in 1827 the principle adopted was to throw upon each parish the cost of its roads if such cost was under 6*d.* in the pound, 1764, 1765——Notice given to the several Commissioners when there was last an election of members; persons then elected; 1769–1772. 1774–1776——Reason for some of the officers of the Commission holding other offices, 1773——Custom in elections of Commissioners to select representatives of the several districts, 1777, 1778.

Luke's St., Parish. Failure of an attempt of the Commission to hand over the City-road and the toll to the care and maintenance of St. Luke's parish, *Browse* 59–62; *Lord Lonsdale* 1515–1523.

Lyon, James, Wittit. Analysis of his Evidence.—Proportion of the Lyon estate, as applicable to the Harrow-road district, which is allotted to the parish of Paddington and to the parish of Marylebone; clause read from one of the Acts hereon, 434–436——Mode of appropriation of any surplus in the event of the estate producing more than sufficient to maintain the roads, 437. 441——Payment still to be made to Paddington and Marylebone if the tolls in the district be removed altogether, 438–442.

Report, 1855—*continued.*

Lyon, James Wittit. (Analysis of his Evidence)—*continued.*

(*Mr. Browse*).—The Commissioners have spent 4,614 *l.* in improving the Harrow-road; it much required improvement, 443-449 ——About a mile of the Harrow-road is in Paddington parish, 450——Difference of opinion as to the distance of road under the Commissioners in St. Margaret's and St. John's parish, and in Kensington, 451—— Explanation relative to the rate in the pound, on the assessment to the poor-rate in the several parishes, which witness estimates as sufficient to defray the cost of maintaining the roads, 454-464.

Lyon Estate and Harvist Estate. Repair of the road from London to Harrow, and from London to Edgeware out of Lyon's Estate and the Harvist Estate, separate accounts being kept as regards those roads, *Browse* 46-55. 160.

Proportion of the Lyon estate, as applicable to the Harrow-road district, which is allotted to the parish of Paddington and to the parish of Marylebone; clauses read from one of the Acts hereon, *Lyon* 434-436——Mode of appropriation of any surplus in the event of Lyon's estate producing more than sufficient to maintain the road, *ib.* 437. 441——Payment still to be made to Paddington and Marylebone if the tolls in the district be removed altogether, *ib.* 438-442.

Out of about 3,600 *l.* a year received from the Harrow-road trust, a certain portion is paid to the parishes of Paddington and Marylebone, and the remainder is allocated to the Harrow and Edgware-roads, *Browse* 711-715——Benefit through Lyon's trust, which at present is not increasing, to the parishes of Paddington and Marylebone, *Lord Lonsdale* 1745-1748.

Return of sums received by the Commissioners from the trust estates of John Lyon (known as the Paddington and Kilburn estates), and from the trust estate of Edward Harvist; together with the appropriation of the same, agreeably to the Act 10 Geo. 4, c. 59, during five years ended 25 March 1856, *App. p.* 112.

See also *Harrow-road.*

M.

Maiden Lane Gate. Traffic check from 12 o'clock, Wednesday night, June 25, to 12 o'clock, Thursday night, June 26, 1856, *App. p.* 118.

Main Roads. Approval of toll in the care of main roads from one town to another, *Neild* 601. 669-674.

Maintenance. See *Cost of Maintenance.*

Management. There should be but one management for the sewers and the roads, *Bradfield* 1340-1342.

Margaret's St., and St. John's, Parish. Disadvantage to this parish if the toll be removed and the expense of the roads thrown upon the parish, *Browse* 372-374——Mileage under the Commissioners in the parish; difference of opinion hereon, *ib.* 373-375. 451—— Natural objection on the part of the parish to be rated for the main thoroughfare leading from London to the country, *Neild* 611, 612.

Statement of the length and estimated cost of the metropolitan roads, with the amounts of assessment to the poor, and the rate in the pound, *App. p.* 110.

Marylebone. See *Lyon Estate amd Harvist Estate. Parishes.*

Materials for Repair. Anticipated reduction in the price of contract materials, *Lord Lonsdale* 1621, 1622.——*See* also *Contracts. Granite.*

Meetings of Commissioners. The Metropolis Roads Commissioners meet about once a month, *Wright* 511——Nature of the attendance at the meetings, *ib.* 512-514. 526-532. 545, 546.

Dates of meetings from July 1854 to June 1856; number of Commissioners attending each meeting, *App. p.* 114——Names of the Commissioners who attended the meetings of the Board and committees, and the number of attendances of each from July 1854 to June 1856, *ib.*

Metropolis Roads Commission. The Commission was constituted in 1826 under the Act 7 Geo. 4, c. 142, *Browse* 7, 8——In 1826 there were fourteen trusts, comprising about 130 miles, handed over to the Commissioners, *ib.* 11-13——The Marylebone and Finchley Trust and the New North-road Trust are also under the care of the Commissioners, but the parishes repair the roads, *ib.* 30-32.

Residence or place of business of the Commissioners within the district, *Wright* 515-518——Mode of election of the Commissioners; qualifications required, *ib.* 519-523 ——Opinion of the fitness personally of the Commissioners to transact the business required of them, *ib.* 524-532—— Suggested representation of the toll-payers on the Commission, *Bradfield* 1330.

Report, 1856—*continued.*

Metropolis Roads Commission—continued.

Witness has been chairman of the Metropolis Roads Commission since its commencement, *Lord Lonsdale* 1503. 1506——Introduced into the House of Commons, in 1827, the Bill under which the Commission was constituted, *ib.* 1503-1505——The Commission comprised several of the Metropolitan Members and certain practical persons conversant with the matter to be dealt with, *ib.* 1507. 1723-1727—— Constant care and attention devoted by witness (who is unpaid) to the business of the Commission, *ib.* 1512, 1513.

Anxiety of the Commissioners, as shown in their reports, to abolish or reduce the tolls, *Lord Lonsdale* 1514. 1565, 1566—— Willingness of the Commissioners to reduce or remove the tolls as much as possible, or to transfer the roads to the parishes, if placed in in a position so to do, *ib.* 1623-1625. 1682, 1683. 1764-1768——Notice given to the several Commissioners when there was last an election of members; persons then elected, *ib.* 1769-1772. 1774-1776—— Custom on election of Commissioners to select representatives of the several districts, *ib.* 1777, 1778.

Metropolitan Board of Works. Greater equality in throwing the roads into the management of the Metropolitan Board of Works than into the hands of the district Boards, *Browse* 352-358. 372-375.

Reasons which till recently induced witness to propose the abolition of the Commission, and the transfer of the trust to the Metropolitan Board of Works, under a system of general rate over the metropolitan area, *Bradfield* 1331-1339. 1349-1351.

Mileage Duty. Gain to Government if the tolls be abolished and the omnibus mileage duty increased, *Bradfield* 1406——Respect in which the reduction of the mileage duty was beneficial to the public, *ib.* 1407-1411.

Mornington Crescent Gate. Statement relative to the five lines of omnibuses, viz., the Waterloo, the King's-cross, the Camden-town, the Kentish-town and Highgate, and the Hampstead, all of which pass through the same district, and would if the toll-gate at Mornington-crescent were removed pay the same tolls as at present, with the exception of 40 *l.* a week, *Lines* 889-913. 949-974——There are about seventy-nine omnibuses on these five lines, *ib.* 889. 900——Payment by the Camden-town omnibuses of 4 *l.* a week as a compensation for passing through the Mornington gate, which by a short circuit they could avoid altogether; the full toll would amount to 56 *l.* a week, *ib.* 896. 901, 902. 906-909—— Extensive evasion generally of the Mornington-crescent gate, *ib.* 946—— Impracticability of preventing the evasion by means of side bars, *ib.* 947.

N.

Neild, Henry Isaac. (Analysis of his Evidence.)—Resides in Kensington-park Gardens; is a member of the Kensington vestry, 583, 584——Considerable hardship upon the inhabitants of Kensington in their being liable to one or two tolls in passing from one part of the parish to another, 585-592. 621-627. 632. 634, 635——Very bad position of the gate at the top of Notting-hill; evils consequent thereon, 593-596. 647-653——Statement that the Notting-hill gate nearest to London should be abolished, and that very little would be lost thereby, as the gate at the bottom of the hill would still intercept all the through traffic, 593, 594. 619-621. 645, 646. 670. 677, 678.

Unwillingness of Kensington parish to undertake the maintenance of the two main lines of road leading from the west country to London; propriety of the objection, 597. 601-618. 638. 657. 663——Opinion that the parish would not and ought not to object to the maintenance of the intercommunication lines exclusive of the main arteries, 597-601. 658-665. 675——Relief now given to Paddington at the expense of Kensington, 597——When main roads become streets and form part of a town, their expense should be borne by the parishes; belief that this rule does not apply to Kensington, 601-618. 665-667. 674.

Grievance in all cases where toll gates and side-bars exist in populous districts, 601. 629, 630. 636. 669-671——Approval of tolls in the case of main roads from one town to another, 601. 669-674——As regards the suburban districts, gates should be placed merely at the extreme of the population, and there should be no side-bars, 601. 639-642. 674——Question as to any grievance to Hammersmith if the Kensington gates were removed, and the cost of keeping up the Hammersmith roads transferred to the parish, 619. 641-645. 654-656.

Objection to the cost of the metropolis roads being thrown upon the county, 668—— Defect in the system of tolls on account of the wasteful expenditure incurred in collection, &c., 669——Expediency on the whole of a mixed system, that is, of maintaining all leading thoroughfares by means of tolls and all intermediate communications by parish rates, 669-674.

Report, 1856—*continued.*

New River Company. Circumstance of the New River Company charging an increased price for the water used on the metropolis roads on account of its being now filtered, *Browse* 387–394.

Newington. Evidence relative to three lines of omnibuses on the Newington-road, the fare by one line, stopping short of the Kingsland-gate, being 3 *d.*; by another line, going beyond the gate, being 4 *d.*; and by a third line, also passing through the gate, to a further distance, being 6 *d.*; question as to the increased fare being the result of the toll, *Barber* 1025–1075.

Notting Hill. Injurious effect of the Notting Hill turnpike-gate upon the population of the district, on account of the concentration of public-houses to meet the traffic stopping at the gate, *Gell* 557. 569, 570, 571. 579, 580; *Neild* 593——Witness is not prepared to state that the parish is willing to take charge of the road, or to suggest any means of repairing the road save through the tolls, *Gell* 573–582——Injurious effect of the gate upon the house property on the western side of the gate, *Gell* 557–568; *Neild* 650–653; *Swain* 756–758. 760. 762, 763. 777, 778——Very bad position of the gate at the top of Notting-hill; evils consequent thereon, *Neild* 593–596. 647–653.

Statement that the gate nearest to London should be abolished, and that very little would be lost thereby, as the gate at the bottom of the hill would still intercept all the through traffic, *Neild* 593, 594. 619–621. 645, 646. 670. 677, 678——Annoyance to respectable persons in passing through the gate on account of its being a resort for idlers of low character, *Swain* 756, 757. 764–768. 773–776——Hardship to the parishioners of Notting-hill if rated for the road, which should rather be repaired by Paddington parish, *ib.* 761. 769–772. 777——Claim of Notting-hill for a removal of the gate nearest London, *ib.* 777, 778.

The abolition of the gate in question is estimated by witness at 1,600 *l.*, *Browse* 690——Loss of from 1,500 *l.* to 2,000 *l.* if the gate on the hill were abolished, *Lord Lonsdale* 1761.——*See* also *Hammersmith,*

O.

Omnibuses. Great wear of the roads through omnibuses; they generally stop at the gates as their limit, *Browse* 82–89. 166–169. 197–199——Practice in regard to the payment of the toll by omnibuses; they seldom stop at the gate on purpose, *ib.* 254. 703–705——Reference to the omnibuses and railway vans as causing considerable wear to the roads, *Lord Lonsdale* 1589, 1590. 1595. 1663.

Belief that there are now less than sixteen different omnibus companies or proprietors in London, *Bradfield* 1436–1446——Statement to the effect that there are but two companies in London, the Richmond and the London General Omnibus Company, *Lines* 1446–1452. 1494——The latter has bought up the interest of more than half the trade, *ib.* 1447. 1452——System of association of proprietors in certain districts for the prevention of competition, and the settling of fares, &c. independently of the general company, *ib.* 1447. 1456–1472——The district fares are regulated more by the amount of population in the district than by competition or tolls, *ib.* 1455——Opportunity for competition in the event of exorbitant fares by the existing omnibus interest, *ib.* 1488–1493.

Estimated total receipts of 26,000 *l.* a year, or nearly one-half of the whole from omnibuses; remarks hereon, *Browse* 706–710. 733–735. 743, 744——Belief that there has been no reduction of omnibus fares in consequence of reduction or abolition of tolls, *ib.* 738–744.

Consideration of the fares paid by the public on certain specified lines; inference that the tolls do not operate in keeping up the fares, *Lines* 914–948. 975 *et seq.*——Examination to the effect that the absence of tolls does not reduce the cost generally of travelling by omnibus, or increase the profits of the omnibus proprietors, but conduces considerably to public convenience by enlarged means of communication, *ib.* 948. 975–992——Doubt as to the rate per omnibus, or per mile, which the tolls amount to; it would not be more than five per cent. on the total maintenance of the omnibus, *ib.* 989–1000.

Reason for the non-reduction of omnibus fares in Islington, &c., where the tolls were reduced, *Bradfield* 1359–1363——Instances of omnibuses ceasing to run on account of the tolls, *ib.* 1395——Generally, the abolition of the tolls would lead rather to increased accommodation than to a reduction of fares, though in some instances reductions would most probably be made, *ib.* 1386–1414——Proportion of the toll to the receipt of each omnibus; average number of passengers adverted to hereon, *ib.* 1415–1423——Benefit to the proprietors in the abolition of the tolls, *ib.* 1450–1454——Effect of the tolls in lessening the distances run, and consequently the accommodation, *ib.* 1455. 1482. 1484–1487.

Report, 1856—*continued.*

Omnibuses—continued.

The omnibus interest have only recently objected to the tolls, *Lord Lonsdale* 1592——Great boon to proprietors if the tolls were abolished, *ib.* 1602, 1603. 1658–1662. 1708–1712——Estimate of from 22,000 *l.* to 23,000 *l.* as the sum now received from omnibuses, *ib.* 1655. 1658–1662. 1708——Doubt as to the omnibus traffic being limited by the toll-gates, *ib.* 1680, 1681——Natural objection of omnibuses to bad roads and to the tolls, inasmuch as they are the great conveyers of the public, *ib.* 1732–1740.

See also *Bayswater Omnibuses. Kingsland. Mileage Duty. Mornington Crescent Gate. Newington. Paddington Omnibuses. Public Opinion. Removal of Gates.*

P.

Paddington. Relief now given to Paddington at the expense of Kensington, *Neild* 597.

See also *Lyon Estate and Harvist Estate. Parishes.*

Paddington Omnibuses. Respects in which the absence of tolls on the omnibus line from Paddington to the Bank has been advantageous to the public, *Bradfield* 1365–1367——Three different sections and three rates of fare into which the line of omnibuses from Paddington to the Bank is divided, *Lines* 1368–1384——The advantage of an abolition of the existing tolls is not applicable in the case of the Paddington omnibuses, *ib.* 1385.

Pancras, St., Gate. Traffic check from twelve o'clock Friday night, June 27, to twelve o'clock Saturday night, June 28, 1856, *App. p.* 118.

Parishes. Particulars as to about 15 miles of road having been given up by the Commissioners to the parishes, leaving 121 miles under the care of the former, *Browse* 56–66. 71. 77–79——Probable increase of expense, and deterioration of the roads, if they were entirely handed over to the several parishes, *ib.* 210–220. 267. 273–280. 288–291. 299. 306–307——Inference as to the unwillingness of the parishes generally to undertake the maintenance of the roads, *ib.* 221–224. 270–272——Probable increase of staff required by the parishes if the maintenance of the roads be transferred to them, *Wright* 486–490.

Witness advocates the entire removal of the toll gates, and the management of the roads by the Metropolitan Board of Works, each parish being rated for its own roads, instead of contributing to a general rate, *Bradfield* 1336–1354. 1424–1435. 1495–1502——Injustice to certain parishes in a system of general rate, *ib.* 1336. 1433, 1434.

The successful objection in 1830, by the parish of St. Luke's, to bear any portion of the expense of the City-road, and the anticipated objection of Parliament to sanction the transfer of the roads to the parishes, have prevented the Commissioners from taking further steps in that direction, *Lord Lonsdale* 1515–1525. 1564–1571——Large expenditure at present by the Commission on parish roads within the gates, *ib.* 1526, 1527——If the tolls be abolished, the only alternative would be to throw the expense on the parishes, *ib.* 1535. 1561.

Sundry obstacles in the way of a transfer of the roads within the metropolitan area to the parishes through which they run, so that such parishes as Marylebone, St. Pancras, &c., should pay for their own roads; inequality and undue expense to several parishes thereby, *Lord Lonsdale* 1538 *et seq.*; 1742, 1743——Evidence on the question of throwing that portion of the road within the gates upon the parishes; difficulties therein, *ib.* 1647–1649. 1675 *et seq.*——Witness does not consider that, in 1827, the principle adopted was to throw upon each parish the cost of its road, if such cost was under 6 *d.* in the pound, *ib.* 1764, 1765.

Return of the lengths and estimated cost of the metropolis roads in the several parishes through which they pass, within the limits of the Metropolitan Local Management Act, with the amounts of assessment to the poor, and the rate in the pound, *App. p.* 110——Similar return in regard to the parishes beyond the limits of the Act, *ib.* 111.

See also *Chelsea. Luke's, St., Parish. Rate. Suburban Districts.*

Pattisson, Joseph. (Analysis of his Evidence.)—Surveyor, since September 1845, of the parish roads in Chelsea, 779, 780——The toll-gates in the parish were removed by Act, in August 1845; 781——Better condition of the roads since they have been transferred to the parish, 782, 783. 844. 874. 875——Examination as to the increase of rate consequent on the transfer, 784 *et seq.*; 853 *et seq.*——Out of the improvement rate of 1 *s.* 6 *d.*, under the Act of 1845, 6 *d.* is allocated to the highways; particulars hereon, 784, 785. 790, 791. 848, 849. 858–862.

The roads are, altogether, 23 miles in length, including about 2¾ miles formerly repaired by the Metropolis Commissioners, 792–795. 847——Satisfaction of the inhabitants as regards the removal of the toll-gate, and the other improvements, under the Act of 1845; 797, 798. 816–823. 832, 833——Statement relative to a small portion of road

Report, 1856—*continued.*

Pattisson, Joseph. (Analysis of his Evidence)—*continued.*

in the parish, as still repaired at the expense of the Commissioners, 799–806. 844—— Increase of omnibuses through the parish, and reduction of fares, since 1845; probable reason, 824–827. 841–843. 845, 846——Repair of the roads with granite; how procured and prepared; cost thereof, 828–831. 834–840. 850–852.

Poor rate assessment of 201,196 *l.* in 1845, upon which the highway rate of 6 *d.* in the pound is levied, 848, 849——Average sum of 300 *l.* per mile, or 6,800 *l.* altogether put down by the vestry of the parish, as the cost of paving materials, cartage, labour, and watering, 854–859. 879–885——Discrepancy adverted to, as between the total cost of 6,800 *l.*, and the allocation of 6 *d.* in the pound on 201,196 *l.*; 858–862. 879——Probable increase of staff when the 2 ¾ miles of metropolis roads were transferred to the parish, and the Improvement Act passed, 872, 873——Very bad state of the parish roads before the operation of the Act, 874–878.

[Second Examination.]—Further evidence as to the produce of the rate of 6 *d.* in the pound, and the total cost of 6,800 *l.*; the poor assessment as regards Hans Town, namely, 48,000 *l.*, was not included in the assessment of 201,196 *l.*; 1076–1081. 1119–1122—— Further evidence as to the increase of rates in Chelsea parish since the passing of the Improvement Act of 1845; 1082 *et seq.*——Effect of the Metropolis Local Management Act in keeping up the rates, 1083–1094——Increase, as regards the Hans Town district, of from 6 *d.* to 9 *d.*, in the lighting and paving, &c., rate for 1856, as compared with 1855; causes assigned, 1088–1094. 1106–1118. 1123–1152——Mode of keeping the accounts in regard to the expenditure on paving, sewerage, &c., 1135–1152.

Pleasure Traffic. The pleasure traffic pays the smallest proportion of the tolls, *Lord Lonsdale* 1592. 1653. 1708, 1709. 1735–1737.

Populous Districts. Grievance in all cases where toll-gates and side-bars exist in populous districts, *Neild* 601. 629, 630. 636. 669–671.

Public Opinion. Few representations from the omnibus interest or the public for the removal of the gates, *Lord Lonsdale* 1697–1704. 1710, 1711.

R.

Railways. Effect of the construction of railways upon roads and upon the action of the Commission, *Browse* 67–70. 130–132——Effect of railways in reducing the receipts from tolls, *Lord Lonsdale* 1666–1669.

Rate. Doubt as to the expediency of a highway rate in lieu of tolls, *Browse* 248–255. 268, 269——Explanation relative to the rate in the pound on the assessment to the poor-rate in the several parishes, which witness estimates as sufficient to defray the cost of maintaining the roads, *Browse* 454–464; and *App. p.* 110, 111——Advantage if the entire district within the gates would consent to a small uniform rate for maintaining the roads, *Lord Lonsdale* 1631–1637——Inequality in a system of uniform rate over the district through which the roads run, *ib.* 1647–1649. 1689–1696. 1752, 1753—— Inequality in a uniform rate over the area under the Metropolis Management Act, *ib.* 1690–1696——Question as to the propriety of a uniform district rate, according to individual estimates from the parishes, each parish being allowed to expend its own proportion upon its roads, *ib.* 1749–1753.——*See* also *Chelsea. County Rate. Parishes.*

Re-appointment of Committee. Recommended re-appointment of the Committee next Session, *Rep. p.* iii.

Receipts and Expenditure. The tolls of each district are applied to the reduction of the general debt, there not being a separate account of receipt and expenditure for each trust, *Browse* 37. 158–162——Amount received from tolls and from trust property respectively in the year 1827-28, and in 1855-56; decrease of about 11,000 *l.*, *ib.* 90–103——The tolls in 1855-56 amounted to 60,367 *l.*, and the trust property to 3,416 *l.*, whereas in 1827-28, the income from tolls and other sources, now available, was 75,768 *l.*, *ib.* 90–100——Investment during the last year of 10,263 *l.* in Exchequer Bills adverted to, *ib.* 110–112——Surplus receipts of about 5,000 *l.* in the last four years, *ib.* 113——Estimate income during the current year of 64,950 *l.*, and estimated expenditure of 64,945 *l.*, *ib.* 118, 119. 240–242.

The highest amount received by the Commissioners from tolls in any year was 83,497 *l.* in 1837, *Browse* 313——Increase of expenditure as the traffic or the income increases, *ib.* 314——Clear balance of 5,600 *l.* in the hands of the Commissioners at the commencement of the present financial year, *ib.* 550–552——The average annual receipt of tolls for the five years ending 1835 was 78,138 *l.*; for the ten years ending 1845 was 72,380 *l.*; and for the ten years ending 1855 was 64,695 *l.*; *ib.* 1153–1159.

Surplus balance of about 8,000 *l.* now in the hands of the Commissioners, a debt of 150,000 *l.* having been paid off since 1827, *Lord Lonsdale* 1509–1511.

See also *Cost of Maintenance. Debt. Improvements.*

Reduction

Reports, 1855—*continued.*

Reduction of Tolls. Reference to the reports of the Metropolis Roads Commissioners as showing that one of its chief objects was a reduction of the tolls, *Bradfield* 1278—— Low scale of tolls now charged by the Commissioners, *Lord Lonsdale* 1580.

Regent Street. Mode and cost of repair of Regent-street, *Browse* 275-280. 288-290—— Particulars as to the traffic through Regent-street on Saturday 21st June, from 12 a. m. till 12 at night; total of 10,339 vehicles and 196 saddle-horses, *Fawcett* 1003-1005—— Cheaper maintenance of the roads by the Woods and Forests, as in the case of Regent-street, than by the Metropolis Commission, as in the case of the City-road, *Bradfield* 1344.

Removal of Gates. Statement of the several removals of toll-gates down to the year 1847, since which period no material alteration has taken place, *Browse* 70-81——Diminution in income and increase in the cost of repairs which have prevented any further removals of toll-gates to greater distances from London, *ib.* 82-119. 314-320. 425-428——On the London side of the gates, eleven miles and five furlongs have been given up by the Commissioners, the repairs on which, costing about 15,700 *l.*, are defrayed out of the tolls levied beyond the gates, *ib.* 165-174. 178-186——Increase of omnibus accommodation according as the toll-gates are removed further from London; instances of this, *Bradfield* 1355-1358. 1364.

Several toll-gates which have been removed further from London since 1831, *Lord Lonsdale* 1514——Impracticability of any removal of the gates further from London on account of the great loss of revenue thereby, *ib.* 1528, 1529. 1630——Loss of from 15,000 *l.* to 17,000 *l.* a year if the gates were removed another half or three quarters of a mile from London; similar increase if they resumed their former positions, *ib.* 1534. 1561-1563. 1586-1588.

Repairs. See *Cost of Maintenance. Granite. Improvements.*

S.

Scavengers. Increased expense since 1852 in cleansing the roads, *Browse* 378, 379.

Sewers. See *Management.*

Side-bars. Increase of side-bars in order to prevent evasion of tolls; how far effectual, *Browse* 122-127——There are now eighty-one side-bars, whilst in 1828 there were only 45, *ib.* 193-196.

Slopping. List of contractors who last tendered, *Browse* 1645.

Staff. See *Establishment, &c.*

State of the Roads. Very bad state of the roads in 1826, *Browse* 38-40. 158-162; *Lord Lonsdale* 1508——The roads are now in a good condition, and are to a great extent repaired with granite, *Browse* 45. 205-209——Tolerably good state of the metropolis roads handed over to Chelsea parish, *ib.* 192——Better condition of the Chelsea roads since they have been transferred to the parish, *Pattisson* 782, 783. 844. 874, 875——Very bad state of the Chelsea parish roads before the operation of the Local Improvement Act of 1845, *ib.* 874-878.

There has, since 1827, been a large sum expended upon the roads, and they have been put in complete repair, *Lord Lonsdale* 1509, 1510.

See also *Drainage. Granite. Improvements.*

Statute Labour. Discontinuance since 1838, or rather since 1836, of receipts under the head of statute-labour, *Browse* 155-157.

Suburban Districts. As regards the suburban districts, gates should be placed merely at the extreme of the population, and there should be no side-bars, *Neild* 601. 639-642. 674——Propriety, if practicable without injustice, of throwing the expenses of their own roads upon the suburban parishes within the gates, *Lord Lonsdale* 1717-1722 1741-1751.

Surrey and Sussex. Rate of tolls and position of the gates on the Surrey and Sussex roads near the metropolis as compared with the roads under the Commissioners, *Browse* 398-412.

Surveyor of the Roads. Witness has been surveyor to the Metropolis Roads Commission since 1853; has been in the employment of the Commission since 1827, *Browse* 1-6—— Circumstance of Mr. Browse holding office other than under the Commission, *Bradfield* 1295, 1296. 1300-1302——Explanation of the foregoing circumstance, *Lord Lonsdale* 1773.

Report, 1856—*continued.*

Swain, Richard Thomas. (Analysis of his Evidence.)—House agent at Notting-hill, 753-755——Effect of the Notting-hill gate in depreciating the value of house property in its neighbourhood on the western side, 756. 758-760. 762, 763. 777, 778——Annoyance to respectable persons in passing through the gate on account of its being a resort for idlers of low character, 756, 757. 764-768. 773-776——Hardship to the parishioners of Notting-hill, if rated for the maintenance of the road, which should rather be repaired by Paddington parish, 761. 769-772. 777——Claim of Notting-hill for a removal of the gate nearest London, 777, 778.

T.

Toll-gates. Doubt as to any increase of buildings, and population in places whence the gates have been removed, *Browse* 128, 129. 187-191——In 1828 there were forty-five toll-gates; there are now only thirty-six, *ib.* 193, 194——Question as to the effect of of a toll-gate upon the value of house poperty on either side of it, *ib.* 332——Prejudicial effect generally of toll-gates upon the property in the neighbourhood, *Ashpitel* 1180. 1192-1195. 1198. 1200, 1201; *Lord Lonsdale* 1758-1763——Inference that the toll-gates are not an unequal mode of covering the cost of the roads, inasmuch as the parishes do not wish for their removal, *Lord Lonsdale* 1591, 1592——Difficulty, seemingly, under any other system than the present, *ib.* 1675-1696.

Tower Hamlets. Prejudicial effects of the tolls in the Tower Hamlets district upon the property therein, *Ashpitel* 1179, 1180——The Tower Hamlets and Marylebone should be represented at the Board of Commission, *Bradfield* 1330.

Traffic. See *Agricultural Traffic. Commercial Traffic. Omnibuses. Pleasure Traffic.*

W.

Wandsworth Road. Explanation as to the removal, in 1849, of the gate near Vauxhall Bridge to a short distance down the Wandsworth-road, *Browse* 295. 305. 310-312.

Watching and Lighting. Discontinuance since the Act of 10 Geo. 4, c. 59, of the collection of a rate for watching and lighting, *Browse* 63-66.

Watering. The roads are watered by contract, *Browse* 361. 395——Out of 120 miles of road 102 miles are watered, *ib.* 362, 363——Reference to the circumstance of a portion of the roads in Upper Clapton having for three or four years been watered at the expense of the inhabitants, *ib.* 364-371——Greater outlay in watering during the five years since the debt of the Commissioners has been paid off, *ib.* 368. 384——Those portions of the districts which are not watered pay towards the watering of the other portions, *ib.* 376, 377——List of contractors who last tendered for the watering, *ib.* 1645.

See also *New River Company. Waterworks Companies.*

Waterloo Omnibuses. Route of the Waterloo omnibuses; they pay no toll in the district under the Metropolis Roads Commission, *Lines* 890-892. 955-960.

Waterworks Companies. Sundry points, requiring explanation, in the Reports of the Commissioners, in regard to sums due to them by the Waterworks Companies, *Bradfield* 1292, 1293.

Wear of the Roads. See *Coal Traffic. Omnibuses.*

Woodford and Layton Railway. Diminution of receipts from tolls in the Hackney and Lee Bridge districts when this railway opens, *Browse* 130.

Wright, Vincent Charles. (Analysis of his Evidence.)—Accountant to the Metropolis Roads Commission, 465——Payment by the Commissioners of four per cent. interest on a loan contracted to pay off debts handed over to them, upon which a much hrgher rate of interest was paid, 467, 468——Witness cannot furnish detailed information as to the cost of collection and of maintaining the several toll-gates and side-bars, 469-474——As regards the districts not let out by the Commissioners, he can supply separate accounts of the cost of maintaining the roads, and of collection, 470-477. 483-485.

System of net payment by the toll collectors to the superintendent, the cost of wages, &c., being first deducted, 471. 476-478—— Check through means of a superintendent, and occasionally through means of a system of espionage, upon the honesty of the collectors, 479-483. 498-500. 503, 504——Probable increase of staff required by the parishes if the maintenance of the roads be transferred to them, 486-490——Advantages of the Metropolis Commission over the individual parishes, in regard to contracts for the supply of granite, &c., and for watering, 491-497.

Mr.

Report, 1856—*continued.*

Wright, Vincent Charles. (Analysis of his Evidence)—*continued.*

(Mr. *Browse.*)—Explanation, in addition to that of Mr. Wright, as to the checks upon the conduct of the toll collectors, 500-505——(Mr. *Wright.*) There is a yearly audit of the accounts by the Commissioners themselves; minute monthly examination by a finance committee of the Commissiouers adverted to hereon, 506-510. 533-542——The Commission meets about once a month, 511——Nature of the attendance at the meetings, 512-514. 526-532. 545, 546——Residence or place of business of the Commissioners within the district, 515-518——Mode of election of the Commissioners; qualification required, 519-523——Opinion as to the fitness personally of the Commissioners to transact the business required of them, 524-532.

(Mr. *Wright* and Mr. *Browse.*) Loss of about 3,000 *l.* a year, if the City-road gate were abolished, 547-549——(Mr. *Wright.*) Cost of 5 *l.* or 6 *l.* a week in keeping up the City-road side-bars, 548——(Mr. *Browse.*) Clear balance of 5,600 *l.* in the hands of the Commissioners at the commencement of the present financial year, 550-552——The Commissioners are not in a position to spend 2,600 *l.* a year on the City-road, without any receipts therefrom, 553, 554.

REPORT

FROM THE

SELECT COMMITTEE

ON

METROPOLIS TURNPIKE ROAD

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

APPENDIX AND INDEX.

Ordered, by The House of Commons, *to be Printed,*
4 *July* 1856.

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REPORT

FROM THE

SELECT COMMITTEE

ON

NEW WESTMINSTER BRIDGE;

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

APPENDIX AND INDEX.

Ordered, by The House of Commons, *to be Printed,*
23 *July* 1856.

Martis, 1° *die Julii*, 1856.

Ordered, THAT a Select Committee be appointed to inquire into the Proceedings which have been taken in relation to the New Westminster Bridge, and to consider the present state of that Structure, and the course which should be adopted in relation thereto; and to report their Opinion to The House.

Jovis, 3° *die Julii*, 1856.

Select Committee nominated of,—

Sir Benjamin Hall.	Mr. Jackson.
Mr. Henley.	Mr. Ker Seymer.
Mr. Bramston.	Mr. Tite.
Colonel Boldero.	

Ordered, THAT the Committee have power to send for Persons, Papers, and Records.

Ordered, THAT Three be the Quorum of the Committee.

Veneris, 4° *die Julii*, 1856.

Ordered, THAT Sir John Shelley and Sir William Jolliffe be added to the Committee.

Mercurii, 23° *die Julii*, 1856.

Ordered, THAT the Committee have power to Report their Observations, together with the Minutes of Evidence.

REPORT - - - - - - - - - - - p. iii
PROCEEDINGS OF THE COMMITTEE - - - p. v
MINUTES OF EVIDENCE - - - - - - - p. 1
APPENDIX - - - - - - - - - - - p. 77
INDEX - - - - - - - - - - - - p. 105

REPORT.

THE SELECT COMMITTEE appointed "to inquire into the PROCEEDINGS which have been taken in relation to the NEW WESTMINSTER BRIDGE, and to consider the present State of that Structure, and the Course which should be adopted in relation thereto, and to report their Opinion to The House;" and who were empowered to report their Observations, together with the Minutes of Evidence taken before them, to The House;—— HAVE considered the Matters to them referred, and have agreed to the following REPORT:

THAT in 1853 an Act was passed, intituled, "An Act to transfer Westminster Bridge" and the estates of the "Commissioners of Westminster Bridge" to the Commissioners of Her Majesty's Works and Public Buildings, and to enable such last-mentioned Commissioners to remove the present bridge and to build a new bridge on or near the site thereof. Under the provisions of that Act the corporation "of the Commissioners of Westminster Bridge" was dissolved.

The Commissioners of Works were incorporated for the purposes of the Act.

The property of the old corporation was vested in the Commissioners of Works, with power to apply the same under the provisions of the Act.

That no funds beyond those so transferred have been provided by the said Act or otherwise. The said Commissioners were also authorised to build a bridge and make approaches thereto, according to a plan referred to as the amended plan.

That a plan is deposited in the Library of the House of Commons, signed by Sir William Molesworth, Sir Charles Barry, and Mr. Page, but it is not accompanied with any detailed plans or drawings, showing the manner of constructing the piers or the work generally.

The Bill was referred to a Select Committee, and evidence was taken thereon.

The mode of constructing the piers of the bridge was not brought fully to the notice of the Committee; indeed, it would seem not to have been at that time decided on.

After hearing evidence, the Committee decided by the casting vote of the Chairman, that the headway under the new bridge should not exceed 20 feet; 26 feet being the height under the lowest of the other Metropolitan bridges.

This decision was affirmed by a small majority upon a division in a thin House.

That by the direction of the Commissioners of Works, a plan (deviating in some points not material from the amended plan) and specifications were prepared by Mr. Page.

It does not appear that the plan so prepared, and proposed mode of construction, although novel, was submitted to any other professional opinion.

Several of the principal firms in the Building and Iron trades were invited to tender for the execution of the work, according to the said plan and specification; three only of these firms sent in tenders.

That a contract was entered into with Messrs. Mare & Co. to execute the works at the end of April 1854, and they were commenced shortly after.

That in September 1855, the contractors, Messrs. Mare, became bankrupt.

That the work was carried on by the assignees until the end of March 1856, when it was entirely suspended.

All the witnesses state that the works appear to be very well done.

The present First Commissioner of Works, in consequence of a representation made to him, instructed Messrs. Rendel & Simpson, on the 31st March 1856, to inquire and report professionally, among other points,—

1. Their opinion of the original scheme, and the exact nature of the scheme.

2. The desirability of proceeding with it.

The report of those gentlemen is before Parliament. Your Committee have examined Messrs. Rendel & Simpson, and also Mr. Stephenson, Mr. Hawkshaw, and Mr. Fowler, all Civil Engineers. The two gentlemen last named were selected by Mr. Page, who was also examined.

A written statement has been put in by Mr. Page, who also had every opportunity of suggesting such questions as he deemed fit to the witnesses.

Application was made by letter on the part of the City of London to be heard on the subject of the headway under the bridge.

The late period of the Session determined Your Committee to confine their inquiry to the proposed mode of construction of the piers, their sufficiency to bear the weight to be put upon them, and how far such a construction can be considered permanent.

The description of the construction of the piers, and plans thereof, will be found in the report of Messrs. Rendel & Simpson. (Parliamentary Paper, No. 318, Session 1856.)

The evidence has satisfied Your Committee that the proposed piers are of strength amply sufficient to bear the weight proposed to be placed upon them.

That the piers will be secure so long as the iron casing remains sound; that the iron casing can be replaced whenever it may decay or be destroyed. That such a mode of construction is less permanent and secure than granite piers founded deep on the London clay by means of cofferdams; but it is less expensive, can be carried out in a shorter period of time, and causes less obstruction to the navigation of the river.

The changes that have taken place in the bed of the River, and in the flow and ebbing of the tides of late years, ought to have due consideration before determining the mode of construction and the headway under the bridge.

The witnesses examined before Your Committee differed somewhat in opinion as to the amount of any probable future change in these respects.

The Report of the Select Committee on Public Offices, presented to The House during the sitting of this Committee, contemplating extensive changes in the immediate neighbourhood and approaches to Westminster Bridge, has been brought to the notice of Your Committee.

Your Committee are of opinion that, subject to the consideration of professional advice to be obtained by the First Commissioner of Works, as to the security of the old bridge, the further progress of the works of the New Westminster Bridge should remain suspended until the Government have had an opportunity of considering and deciding on the advice to be offered to Parliament upon this last subject, when the site of the new bridge might be reconsidered in connexion with any general plan of alteration and improvement of the neighbourhood, as well as the all-important subject of the headway under the bridge.

Your Committee find that upwards of 50,000 *l.* has been already expended.

Subject to the foregoing remarks, subject also to some of the modifications and alterations suggested by the witnesses, Your Committee are of opinion that the plan proposed might have been carried out.

23 *July* 1856.

PROCEEDINGS OF THE COMMITTEE.

Martis, 8° *die Julii*, 1856.

MEMBERS PRESENT:

Sir B. Hall.	Mr. Jackson.
Mr. Henley.	Mr. Ker Seymer.
Mr. Bramston.	Mr. Tite.
Colonel Boldero.	Sir W. Jolliffe.

Mr. HENLEY was called to the Chair.

The Committee deliberated as to their course of proceeding.

[Adjourned till Friday next, at Twelve o'clock.

Veneris, 11° *die Julii*, 1856.

MEMBERS PRESENT:

Mr. HENLEY, in the Chair.

Mr. Bramston.	Sir J. Shelley.
Mr. Ker Seymer.	Mr. Tite.
Sir W. Jolliffe.	Colonel Boldero.
Sir B. Hall.	

Room cleared. Committee deliberated.

Mr. *Alfred Austin*, Mr. *Thomas Page*, Mr. *James M. Rendel*, and Mr. *James Simpson*, examined.

[Adjourned till Tuesday next, at Twelve o'clock.

Martis, 15° *die Julii*, 1856.

MEMBERS PRESENT:

Mr. HENLEY, in the Chair.

Mr. Tite.	Colonel Boldero.
Sir B. Hall.	Mr. Jackson.
Sir W. Jolliffe.	Sir J. Shelley.

Mr. *Robert Stephenson*, a Member of The House, and Sir *B. Hall*, a Member of the Committee, examined.

[Adjourned till Friday next, at Twelve o'clock.

Veneris, 18° *die Julii*, 1856.

MEMBERS PRESENT:

Mr. HENLEY, in the Chair.

Mr. Tite.	Mr. Ker Seymer.
Mr. Jackson.	Sir J. Shelley.
Sir B. Hall.	Mr. Bramston.
Sir W. Jolliffe.	Colonel Boldero.

Mr. *John Hawkshaw* and Mr. *John Fowler*, examined.

Mr. *Thomas Page* and Mr. *R. Stephenson*, further examined.

[Adjourned till Wednesday next, at Twelve o'clock.

Mercurii, 23° *die Julii*, 1856.

MEMBERS PRESENT:

Mr. HENLEY, in the Chair.

Mr. Bramston.	Sir B. Hall.
Sir J. Shelley.	Mr. Ker Seymer.
Mr. Tite.	

Mr. *T. Page*, Mr. *Rendel*, and Mr. *Simpson*, further examined.

Room cleared. Committee deliberated.

Draft Report, proposed by the Chairman, read 1°, as follows:

"1. THAT in 1853 an Act was passed, intituled, 'An Act to transfer Westminster Bridge' and the estates of the 'Commissioners of Westminster Bridge' to the Commissioners of Her Majesty's Works and Public Buildings, and to enable such last-mentioned Commissioners to remove the present bridge and to build a new bridge on or near the site thereof. Under the provisions of that Act the corporation 'of the Commissioners of Westminster Bridge' was dissolved.

"2. The Commissioners of Works were incorporated for the purposes of the Act.

"3. The property of the old corporation was vested in the Commissioners of Works, with power to apply the same under the provisions of the Act.

"4. That no funds beyond those so transferred have been provided by the said Act or otherwise. The said Commissioners were also authorised to build a bridge and make approaches thereto, according to a plan referred to as the amended plan.

"5. That a plan is deposited in the Library of the House of Commons, signed by Sir William Molesworth, Sir Charles Barry, and Mr. Page, but it is not accompanied with any detailed plans or drawings, showing the manner of constructing the piers or the work generally.

"6. The Bill was referred to a Select Committee, and evidence was taken thereon.

"7. The mode of constructing the piers of the bridge was not brought fully to the notice of the Committee; indeed, it would seem not to have been at that time decided on.

"8. After hearing evidence, the Committee decided by the casting vote of the Chairman, that the headway under the new bridge should not exceed 20 feet; 26 feet being the height under the lowest of the other Metropolitan bridges.

"9. This decision was affirmed by a small majority upon a division in a thin House.

"10. That by the direction of the Commissioners of Works, a plan (deviating in some points not material from the amended plan) and specifications were prepared by Mr. Page.

"11. It

"11. It does not appear that the plan so prepared, and proposed mode of construction, although novel, was submitted to any other professional opinion.

"12. Several of the principal firms in the building and iron trades were invited to tender for the execution of the work, according to the said plan and specification.

"13. That a contract was entered into with Messrs. Mare & Co. to execute the works at the end of April 1854, and the work was commenced shortly after.

"14. That in September last, the contractors, Messrs. Mare, became bankrupt.

"15. That the work was carried on by the assignees until the end of March 1856, when it was entirely suspended.

"16. All the witnesses state the work appears to be very well done.

"17. The Chief Commissioner of Works, in consequence of representation made to him on the 31st of March last, instructed Messrs. Rendel & Simpson to inquire and report professionally, among other points,—

"1. Their opinion of the original scheme, and the exact nature of the scheme.

"2. The desirability of proceeding with it.

"18. The report of those gentlemen is before Parliament. Your Committee have examined Messrs. Rendel & Simpson, and also Mr. Stephenson, Mr. Hawkshaw, and Mr. Fowler, all civil engineers. The two gentlemen last named were selected by Mr. Page, who was also examined.

"19. A written statement has also been put in by Mr. Page, who had every opportunity of suggesting such questions as he deemed fit to the witnesses.

"20. Application was made by letter on the part of the City of London to be heard on the subject of the headway under the bridge.

"21. The late period of the Session determined Your Committee to confine their inquiry to the proposed mode of construction of the piers, their sufficiency to bear the weight to be put upon them, and how far such a construction can be considered permanent.

"22. The description of the construction of the piers, and plans thereof, will be found in the report of Messrs. Rendel & Simpson. Parliamentary Paper, No. 318, Session 1856.

"23. The evidence has satisfied Your Committee that the proposed piers are of strength amply sufficient to bear the weight proposed to be placed upon them.

"24. That the piers will be secure so long as the iron casing lasts; that the iron casing can be easily replaced whenever it may decay or be destroyed. That such a mode of construction is less permanent and secure than granite piers, founded deep on the London clay by means of cofferdams; but it is less expensive, and can be carried out in a shorter period of time.

"25. Your Committee are of opinion that it would have been more desirable to build a bridge of such importance over such a river in the most permanent manner.

"26. The changes that have taken place in the bed of the river, and in the flow and ebbing of the tides of late years, ought to have due consideration before determining the mode of construction and the headway under the bridge.

"27. The witnesses examined before Your Committee differed somewhat in opinion as to the amount of any probable future change in these respects.

"28. The Report of the Select Committee on Public Offices, presented to The House during the sitting of this Committee, contemplating extensive changes in the immediate neighbourhood and approaches to Westminster Bridge, has been brought to the notice of Your Committee.

"29. Your Committee are of opinion that, subject to the consideration of responsible professional advice to be obtained by the Chief Commissioner of Works, as to the security of the old bridge, further progress of the works of the New Westminster Bridge should remain suspended until the Government have had an opportunity of considering and deciding on the advice to offer to Parliament upon this last subject, when the all-important subject of the headway under, and the site of the new bridge, might be re-considered in connexion with any general plan of alteration and improvement of the neighbourhood.

"30. Your Committee, upwards of 50,000 *l.* having been already expended, would otherwise have been of opinion that the plan proposed, subject to some of the alterations and modifications suggested by the witnesses, might with propriety have been carried out."

Motion made and question, "That the Draft Report proposed by the Chairman be now read 2°, and considered paragraph by paragraph" (Sir *B. Hall*), put, and agreed to.

Paragraphs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, read, and agreed to.

Paragraphs 12, 13, 14, read, amended, and agreed to.

Paragraph 15 read, and agreed to.

Paragraphs 16, 17, 18, 19, read, amended, and agreed to.

Paragraphs 20, 21, 22, 23, read, and agreed to.

Paragraph 24 read, amended, and agreed to.

Paragraph 25 read. Motion made and question proposed, "That this paragraph stand part of the proposed Report" (Sir *B. Hall*). Question put. Committee divided:

Ayes, 2.	Noes, 3.
Mr. Bramston.	Mr. Tite.
Sir B. Hall.	Sir J. Shelley.
	Mr. Ker Seymer.

Paragraphs 26, 27, 28, read, and agreed to.

Paragraphs 29, 30, read, amended, and agreed to.

Motion made and question, "That the proposed Report, as amended, be the Report of the Committee to The House," put, and agreed to.

Ordered, To Report, together with the Minutes of Evidence.

LIST OF WITNESSES.

Veneris, 11° *die Julii*, 1856.

Alfred Austin, Esq. - - - - - - - - - - - - p. 1
Thomas Page, Esq. - - - - - - - - - - - - p. 1
Alfred Austin, Esq. - - - - - - - - - - - - p. 9
James Meadows Rendel, Esq., and James Simpson, Esq. - - - - p. 14

Martis, 15° *die Julii*, 1856.

Robert Stephenson, Esq., M. P. - - - - - - - - - - p. 26
The Right Hon. Sir Benjamin Hall, Bart., M. P. - - - - - - p. 37

Veneris, 18° *die Julii*, 1856.

John Hawkshaw, Esq., and John Fowler, Esq. - - - - - - p. 38
Thomas Page, Esq. - - - - - - - - - - - - p. 54
Robert Stephenson, Esq., M. P. - - - - - - - - - - p. 57

Mercurii, 23° *die Julii*, 1856.

Thomas Page, Esq. - - - - - - - - - - - - p. 62
James Meadows Rendel, Esq., and James Simpson, Esq. - - - - p. 69
Thomas Page, Esq. - - - - - - - - - - - - p. 74

MINUTES OF EVIDENCE.

Veneris, 11° *die Julii*, 1856.

MEMBERS PRESENT.

Mr. Henley.	Mr. Tite.
Sir W. H. Jolliffe.	Mr. Ker Seymer.
Mr. Bramston.	Sir John Shelley.
Sir Benjamin Hall.	Colonel Boldero.

THE RIGHT HON. JOSEPH WARNER HENLEY, IN THE CHAIR.

Alfred Austin, Esq., called in; and Examined.

A. Austin, Esq.

11 July 1856.

1. *Chairman.*] WHAT office do you hold at the Board of Works?—Secretary.

2. You are aware that an Act of Parliament was passed in the year 1853 transferring Westminster Bridge to the Office of Works?—Yes.

3. Can you inform the Committee what was done in consequence of that transfer by the Act of Parliament to the Board of Works with respect to the building of Westminster Bridge; what was the first step taken in consequence?—I have only comparatively recently become secretary to the Board, and do not know anything that happened at that period personally; I believe, from a perusal of the correspondence, that the first material step was an endeavour on the part of the Board to obtain a contract for building the bridge.

4. From your acquaintance with the records of your office, are you able to state to the Committee what steps were taken in pursuance of the authority of that Act of Parliament?—I cannot state, with great exactness, what steps were taken. I know generally that certain contractors were invited to send in tenders, and that certain contractors did send in tenders, and that one of those tenders was accepted.

5. Do you know by whom the specifications were prepared?—I suppose that Mr. Page, the architect, prepared them.

6. Mr. *Bramston.*] You were not in the office at the time?—No.

7. Sir *W. H. Jolliffe.*] How long have you been at the Board of Works?—Since last November.

8. When were the works suspended?—In March.

Thomas Page, Esq., called in; and Examined.

T. Page, Esq.

9. *Chairman.*] YOU are the Engineer for the Board of Works?—I am the Engineer employed by them for Westminster Bridge and the Chelsea Bridge and embankment.

10. Were you so in the year 1853?—Yes.

11. You are aware that an Act of Parliament was passed in 1853 transferring Westminster Bridge and the direction of the building of the new bridge to the Office of Works?—I am.

12. In consequence of that authority being transferred to the Board of Works, were any plans prepared by you to carry out that object?—They were prepared by me.

T. Page, Esq.

11 July 1856.

13. Were those plans the same as the amended plan recommended by the House of Commons in the Act of Parliament, or was there any difference between them, and if any, what was the difference?—The plan which was decided on by Sir William Molesworth is shown on that drawing before the Committee, "Contract Drawing No. 1."

14. The Act of Parliament states that the Board of Works is authorised to build a bridge according to what is termed the amended plan referred to in the Act; what was the difference between the plan which you finally prepared and that amended plan?—It was a new deposit; the difference consisted in the headway.

15. I understand you to say that in the plan you have now pointed out there was no other difference from the plan deposited in the House of Commons except in the headway?—And the bridge was made five feet wider.

16. There was a difference of five feet in the width and a difference in the headway?—Yes.

17. Was there any specification of the mode in which the foundations of the bridge were to be constructed, lodged with the deposited plan in the House of Commons?—No; it is not requisite to lodge a specification of the mode in which the foundations are to be constructed. The mode in which the foundations were to be constructed was explained before the Committee which sat upon the Bill.

18. Were the specifications that were prepared by you for carrying out the contract prepared in accordance with that explanation given to the Committee, or was there any variation, and if any, what variation?—They were. The specification required that certain of the piles should be screwed down into the ground, in accordance with the evidence which I gave before the Committee. Then the specification also went into various details, which are not usually stated to a Committee.

19. The general plan in the specification was the same, was it?—Yes.

20. The specification, I suppose, could be put in?—Yes; the specifications for the work.

21. After that plan and specification had been prepared by you was it submitted to the Board of Works?—Yes.

22. Was it approved?—Yes, it was approved, after careful consideration by Sir William Molesworth.

23. Is it within your knowledge, one way or the other, whether, when your plan was submitted by you to the Board of Works, it was submitted to any other professional party or not?—I do not think it was submitted to any other professional party; but the general mode of construction had been considered by Mr. Fowler and Mr. Hawkshaw, before they gave evidence on the Bill.

24. Was it put out to the public for tenders, or were means taken by sending round to large firms to obtain offers for carrying out that work?—To large firms invitations were sent to give tenders for the work.

25. Did more than one of them send in offers?—Yes, three firms sent in offers.

26. Is it within your knowledge whether any of those firms to which letters were sent, made any observation upon the specification as to the plan being a sound one or otherwise?—I do not recollect except in one case; Mr. Fielder, who appeared for Mr. Baker, objected to using wrought-iron piles and plates in the foundation. The specification provided for cast-iron piles and plates, or wrought-iron piles and plates; and a separate amount was to be given for each. The difference between the two amounts with wrought-iron piles and with cast-iron piles was some 12,000 *l.*; and the Chief Commissioner, on my recommendation, decided upon using the cast-iron piles and plates.

27. Can you give the Committee any information as to whether any bridge of that kind, or of any kind, has been built upon a similar plan of foundations?—Not precisely on a similar plan. The Chelsea Bridge, and two bridges at Windsor, built under my superintendence, are nearly similar. There are many bridges also on the continent which are built on piles and concrete, surrounded by timber casing; and Captain Moorsom constructed a bridge with an iron caisson and concrete, without the piling. Mr. Brunel has constructed bridges with cylinders and concrete; and Sir William Cubitt and Mr. Cubitt also. There are very many instances of the foundations being formed with concrete and cylinders. But in this construction, in addition to the concrete, I add timber

timber bearing piles. The wharf at Blackwall constructed by Mr. Walker, and the Adelaide Wharf, and Fenning's Wharf, and several others, were formed with cast-iron piles and plates, backed with concrete. By the addition of the bearing piles, as in London, Waterloo, and Southwark Bridges, and many other bridges, which bearing piles take the weight of the bridge, I assimilate my foundations to a regular piled bridge.

28. Will you name any of the bridges upon the continent which are, as you state, constructed in a like manner, the difference being that they are surrounded with wooden piles around the foundation, instead of iron as proposed here?—The bridge of Jena, on the Seine, and the bridge of Austerlitz, are so constructed. I have a variety of tracings of different works, but I have not them here at present, for I did not expect to be examined upon this subject.

29. Are those bridges large or small?—They are large bridges.

30. Over what streams?—The Seine is one; and there is the bridge at Rouen; also over the same river a bridge at Saumur over the Loire.

31. How long have those bridges been constructed?—I cannot give the dates.

32. Are they modern or ancient bridges?—I suppose some 45; Saumur 70 years.

33. Is the water deep or not?—I cannot speak to the depth of water at those bridges.

34. Those bridges are not subject, any of them, to tides, are they?—No, but to very severe floods.

35. You stated that you proposed the piles to be screwed into the ground; were they, in point of fact, under the specification to be screwed or driven?—They were to be screwed or driven.

36. By whom was the tender accepted?—Mr. Mare.

37. What were the conditions of the tender and the contract, with regard to payment for the work?—The work was to be paid for every six weeks, at the rate of 90 per cent. of the work executed.

38. Who was to certify the amount executed?—The engineer.

39. Ninety per cent. was to be paid of the work executed under the certificate of the engineer, which was yourself?—Yes.

40. Was any bargain made in the contract, as to how the extras, if any, were to be paid for?—Yes, there was a stipulation as to extras being paid for according to the schedule of prices.

41. Were they to be paid for as the work progressed, or at the termination of the work?—They were to be paid for as the work progressed.

42. Upon the same principle as the original contract?—Yes; there was a schedule of prices attached to the contract, and the extra work was to be measured, and so paid for.

43. And the per-centage paid?—And the per-centage paid.

44. In consequence of that contract, was the work commenced?—It was.

45. Can you give the date when the work was commenced?—It was first commenced upon the Middlesex abutment in July 1854.

46. Do you recollect the date when the contract was entered into?—On the 18th October 1854 the contract was signed.

47. Was the contract signed after the work was commenced?—Yes; some delay took place in signing the contract.

48 How long did the work continue in operation?—It continued until the 20th of March this year.

49. During the progress of the work, did you certify from time to time for payments to be made to the contractor?—I did.

50. Was the work carried on during that time to your satisfaction?—Not so rapidly as I could have wished; but the contractor's men were new to the work, and there were difficulties met with in cutting away the piers of the old bridge, which induced me not to recommend very stringent measures with the contractor as to time.

51. Putting time aside, were you satisfied with their mode of doing the work?—Yes, with its stability.

52. What was the cause of the stoppage of the work?—The works were stopped under an arrangement between the Chief Commissioner and the assignees of Mr. Mare.

53. Was the work stopped in consequence of the refusal of the assignees to

T. Page, Esq.

11 July 1856.

go on, or was it stopped in consequence of any action on the part of the Board of Works?—No; the assignees were progressing at the time with very important parts of the work; but some negotiations were pending between the Chief Commissioner and the assignees, with which I was not made acquainted; I only heard of them after the works were stopped; and in consequence of an arrangement made for measuring up the works, and the materials and plant, the assignees, I understood, asked the Chief Commissioner whether they might be allowed to suspend the works; and the answer was, "that they might suspend the works at their convenience."

54. The negotiation which led to the stoppage of the works is not entirely within your knowledge?—Not entirely; I heard of it from other parties.

55. We shall get that better from another witness?—Yes, I conclude so.

56. Was there any difficulty in the engineering part of the work during the time it was going on, which led to the stoppage?—No, not at all.

57. Did you make any report during the time that the work was going on unfavourable to its progress?—Not unfavourable to its progress; I had reported that they were not proceeding so quickly as could be wished, but I have mentioned the difficulties which they had to encounter. The work which was being done at the time of the stoppage consisted of work on the piers and abutments, close to low water mark in some of the piers, and very important work generally; and it was in my opinion of great importance that the work should be proceeded with to the level of two feet above low water mark, before any stoppage took place.

58. Was there, in point of fact, in those difficulties, which you say they were encountering, anything that at all shook your opinion as to the soundness of proceeding with the work upon the plan before determined upon?—Not in the slightest degree.

59. You have said that in March of the present year, the work was finally suspended?—Yes, on the 20th of March; not having received any instructions from the Office of Works as to any negotiation for the suspension of the works, which I had pushed on night and day during the winter, I wrote to the manager of the assignees, to protest against it, and requested that the work should be proceeded with, stating that I had had no instructions from the Chief Commissioner to the contrary.

60. From a report which has been placed in our hands, it appears that a survey of those works was made by Messrs. Rendel and Simpson; were you present at the survey?—I went over the works with Mr. Rendel and Mr. Simpson on two occasions.

61. You have said that you cannot give us exact information as to the negotiations which led to the suspension of the works?—No, I cannot; I know nothing officially; only hearsay.

62. Sir *John Shelley*.] With reference to the plans which were laid before the last Committee, was that Plan No. 1 the plan which was agreed to by the Committee?—No, it was not.

63. What plan was it that came before that Committee?—It was this plan (*producing another Plan*).

64. This plan which you hold in your hand is the plan that was before the Committee, and sanctioned by the Committee?—It was produced to the Committee as the diagram of the bridge.

65. *Chairman*.] Was that the deposited plan?—No, not the deposited plan; this is the deposited plan (*producing another Plan*).

66. Sir *John Shelley*.] In what respect does the plan that was brought before the Committee differ from this?—The one is a plan, and the other is a section and diagram, and cannot be compared.

67. Are the two plans substantially alike, or is there any material alteration?—You cannot make a comparison between them, because the piers are not shown upon the plan, and they are shown upon this section.

68. Were the material points the same; were the piers the same, and the number of arches the same?—The deposited plan does not show any piers, or any number of arches; it is not required by the Standing Orders of The House to show those.

69. I understand you to say that this was the plan that was agreed to by the Chief Commissioner, Sir William Molesworth?—Yes.

70. Was that plan before the Committee?—No, it was not.

71. Was

71. Was it based upon the plan that was before the Committee?—Yes.

72. Are the piers in the same places and the arches the same in number?—There is the same number of arches, but there is some little difference in span; there is 120 feet span in the one plan, and 125 in the other in the centre arch.

73. Did that alteration take place subsequently to the Committee having reported?—Subsequently to the Committee having reported.

74. Then the question never came before the Committee as to the increased size of that arch?—No; the alteration was made in consequence of giving a different curve to the bridge.

75. What curve do you mean; the curve of the road?—It was to obtain a more regular curve for the road.

76. The superway?—Yes; it was not considered by the Chief Commissioner that we should be strictly bound by the spans of the arches in this plan before the Committee.

77. I understand you to say that there was a considerable increase in the size of one of the arches after the Committee had reported?—No; a decrease from 125 to 120 feet span.

78. You are aware that there was a great discussion in the Committee as to the headway of the bridge?—The headway remains the same as decided upon in the Committee.

79. Had the reduction of the size of the arch anything to do with the question of the headway being reduced?—No.

80. Then, in point of fact, this plan which was finally decided upon was not brought before the Committee at all?—Not the working plan.

81. What is the "amended plan" alluded to in the Act of Parliament?—That which I have produced.

82. Then the plan which was finally adopted did not come before the Committee, and consequently is not referred to in the Act?—The plan is the same, with an addition of five feet to the width, and this is a section upon the basis of this plan, with some slight alterations in the span.

83. Sir *W. H. Jolliffe.*] Is that plan, No. 1, the plan upon which the work has proceeded?—It is.

84. Was there no plan of construction submitted to the Committee that sat upon the bridge?—No details of construction.

85. You were examined before the Committee as to the plan upon which you intended to construct the bridge?—I was.

86. Then you do not consider that the Committee in 1853 was in any way implicated in any plan of construction that has been heretofore carried out?—No; I do not consider that the Committee are implicated in the plan of construction.

87. Was the plan of construction explained before the Committee?—Not in all its details; only the principle of construction by iron piles and plates.

88. You recommended that course in the evidence which you gave?—Yes, that principle of construction.

89. Was there any other architect examined before that Committee with regard to that plan?—Not upon the construction.

90. Then the plan that was before the Committee was a ground plan, and a diagram to show the kind of bridge which was proposed to be constructed?—Yes, exactly so.

91. The Committee did not in anything that they did, sanction any particular mode of construction?—No particular mode of construction was mentioned in the Bill; it was explained to the Committee, and no objection was raised against it.

92. The mode of construction was entirely sanctioned and approved by the Board of Works?—Yes.

93. When was it finally approved and settled by the authority of the Board of Works?—It was in 1853 that the drawings were made.

94. Do you recollect the date of the approval by the Board of Works?—I do not recollect the date of the approval.

95. You have mentioned various plans of bridges which have been carried out in France and in England; is there any plan which has been carried out precisely upon this design?—Not precisely; it is nearly similar to the foundations of the Chelsea and Windsor Bridges; it is an improvement upon the mode of constructing the piers on the banks of the Thames, and in other places; it contains

T. Page, Esq.

11 July 1856.

contains bearing piles for carrying the weight of the bridge; it is the same construction in reality as the Blackwall and other wharfs, with the addition of bearing piles for additional support to the bridge.

96. Between the commencement of the work and the signing of the contract, was there any variation in the design for the construction of the bridge?—No.

97. That was, you say, settled in 1853?—Yes.

98. Has it been varied since that time?—There has been a variation in the cast-iron ribs of the roadway. There were to be three cast-iron ribs in the roadway, separating the footpath from the carriage-way, and separating the two carriage-ways in the centre; and these I propose to omit and to use the ordinary ribs of the bridge instead. That is a matter of detail not affecting the plan.

99. That did not refer in any way to the foundation of the piers?—No.

100. Colonel *Boldero.*] Then since the contract was signed, you have made some deviations from the plan?—Since the contract was signed there has been deviation in some parts of the construction, but nothing material.

101. Mr. *Tite.*] At the time of the Committee of 1853, the plan, which is strictly the ground-plan, was laid before the Committee?—Yes.

102. That shows no detail; it shows the width of the bridge and the nature of the approaches?—Exactly so.

103. And it is illustrated by a general section, which shows the height of the arches above the waterway, and the nature of the bed of the river?—Yes.

104. The height of the waterway has not been changed, as I understand?—Not at all.

105. But the spans of some of the arches have been changed?—Yes.

106. Did that change arise when you came to set it out, merely in order to improve the proportions of the bridge, or to find better sites for the piers?—To improve the proportions of the bridge.

107. And the difference is not more than five feet in any case?—No.

108. You say that the drawing for the contract differs from the plan laid before the Committee only in that particular?—Only in that particular and the five feet extra width.

109. Is there any alteration in the foundation?—Only this, that large granite plinths are introduced instead of some Bradford landings and an iron curb; it is a mere difference of material.

110. No difference in principle?—No difference in principle.

111. You spoke of screw piles; was that the same system of foundation that was suggested before the Committee?—That was the same that was suggested, but we have not screwed the piles down; the contractor drove them with my permission, instead of screwing them; there was a saving by that alteration.

112. Was there a greater or less accuracy obtained by driving than by screwing?—There was some difficulty apprehended in bringing the pile round so that the plates would fit carefully in the groove. The piles are grooved, and the plates are driven in the groove, and by driving the piles instead of screwing them, both piles and plates could be driven together, a little at a time; it was an advantage to the work.

113. You said that there are certain bridges on the Continent built without cofferdams?—Yes, many are so built.

114. Do you know much of engineering in France?—Not from personal observation.

115. The Seine is not a tidal river?—Not where those bridges are built which I have named.

116. With respect to the bridge at Rouen of which you spoke, do you know anything of its construction?—I only know it from a drawing; it is a pile bridge, with concrete between the piles, and with timber casing instead of iron casing.

117. Do you know the railway bridge above that, built by Mr. Locke for the Rouen Railway?—I have not been there since that bridge was built.

118. You do not know the fact that he had cofferdams?—No; I am preparing a set of tracings of different bridges which have been built with piles and with concrete, to lay before the Committee.

119. You spoke of Mr. Brunel and Sir William Cubitt having built bridges with piers based on cylinders; is there any analogy between that mode of building and the one you have adopted?—Yes, in the casing and concrete.

120. Will

120. Will you explain your view of the matter?—The casing in both cases is the same; an iron casing and a concrete filling behind; but in my construction I introduce timber bearing piles, assimilating the piers to those of London, Southwark, Waterloo, and other bridges which have piled foundations. Mine is a piled foundation like the foundations of those bridges, but instead of building the pier in solid masonry up to low water, I form the pier with concrete, iron piles, and plates, and a granite slab facing.

121. But with respect to the cylinder of which you spoke as being used by Mr. Brunel and Sir William Cubitt, the pier rests upon the top of the cylinder?—Yes, above low water.

122. Do you know the diameter of the cylinders?—Seven feet.

123. And they are sunk in the earth?—Yes, and filled with concrete.

124. And they form the bed or bearing foundation of the pier itself?—They do.

125. Does not that differ essentially from your system of putting an iron casing round the pier, and resting thereupon bearing piles?—It differs by the addition of the bearing piles. I consider mine superior as a bearing surface, because, besides the iron casing and concrete which they use, the bearing piles give greater resistance, and my foundations are not detached as the cylinders are.

126. The piers rest upon the cylinders themselves?—Yes.

127. They are large enough to allow a man to go to the bottom, and they are filled with concrete, and upon that the foundation is laid?—Just so.

128. Do you still think that there is some analogy between the two systems?—Yes, inasmuch as the outer casing is of the same material, and the filling partly the same.

129. With regard to iron piles, you have quoted the instance of the Blackwall wharf; will you tell the Committee what that is?—It is the Brunswick Wharf at Blackwall, formed of cast iron piles, and plates forming the face next the river, filled in with concrete behind, and secured with iron ties tying in the whole front. There is seven feet water at low water close to that wharf.

130. The iron ties go into the land?—They are secured to mooring piles, driven at some distance behind the face line.

131. They are piles with a groove on the edge, the same as yours, and a plate driven down into that groove?—Yes.

132. What is behind them?—Concrete.

133. Then, instead of concrete, in your case you drive in those bearing piles?—I have both concrete and bearing piles.

134. Then there is an iron casing round the whole of the outside, and within there are bearing piles?—Just so.

135. The bearing piles do not, of course, fill up the whole solid mass; what interval is there between the bearing piles?—About three feet.

136. That is filled up with concrete?—Yes, all round the piles, forming a solid mass within the iron piles and plates.

137. How are you assured that the mud and silt is cleared out completely from between those piles?—It is dredged out to the hard gravel very carefully.

138. Are those piles in rows, so that you can dredge accurately to get the mud out?—They are, as shown in this plan (*producing a drawing*).

139. Then I understand that those plates are kept in by those iron ties?—Yes, by those iron tie bolts. I hope the Committee will visit the work, and see the state of it. I should like to have an opportunity of explaining its construction at greater length, as I have come unprepared with documents and with drawings that will illustrate what I have stated.

140. Sir *John Shelley*.] As regards the evidence taken before the Committee in 1853, are you able to state whether one material point which was brought before the Committee for its consideration was the question of the gradient of the roadway over the bridge, with a view to making it easy of access for the traffic?—It was.

141. You have stated that an alteration has taken place since that time in the size of the arches; has that alteration affected in any way the thickness of the crown of the bridge, so as to affect in any way the gradient of the roadway?—Not in any way.

142. That remains exactly the same as it was then determined?—Just the same.

T. Page, Esq.

11 July 1856.

143. Sir *W. H. Jolliffe.*] You said that you were satisfied with the progress which the works had made, except as to rapidity; that so far as regarded the manner in which they had been carried on you were satisfied?—Yes, and especially after the men had had some experience; latterly the contractors went on very well; as they got more accustomed to the work the work was more rapidly executed.

144. You think it was going on better when this suspension took place than it had previously done?—Yes; certainly.

145. And you stated that you made allowances on account of the difficulties they found with regard to moving the materials of the piers of the old bridge?—I did.

146. It retarded the works?—Yes, it retarded the progress with those new piers which were to occupy the place of the old piers.

147. You found greater difficulties than you had expected?—Not exactly, but the course that the contractor took in removing those buttresses and cutwaters was a course that I should not have taken had I been executing the work myself. I should have had a small engine working constantly, and have cut away the cutwaters by a heavy iron plate or saw in a way that would have avoided delay. But if an engineer imposes on contractors a mode of doing work, he incurs responsibility which sometimes is very inconvenient for him afterwards; therefore I only suggested this mode of proceeding.

148. My question was, whether the difficulties that you met with were greater than those that you anticipated?—The time that was occupied in cutting away was longer than I expected, but the difficulties were not greater than I anticipated when I arranged the design.

149. You think that the difficulties which have arisen in constructing the foundation, have arisen very much from the manner in which the old piers and the old cutwaters have been treated since the bridge has been in its present dilapidated condition?—That is the fact. It requires great care to work up to the old foundations after you have cut through them. This section will show the state of the work at the present time (*producing a section*). This is the Middlesex abutment, for which old pier No. 3 is cut through as far as this line; then old pier No. 7 is cut through; No. 10 is cut through for new pier No. 5, and No. 13 is cut down for the Surrey abutment. These piers of the old bridge are standing in a very different position to what they were in before the works began, because their foundations are completely cut through on the south side, and the caissons on which they stood also are cut away to the face of the bridge.

150. Are they less or more secure than they were?—They are less secure than they were before we commenced.

151. Mr. *Tite.*] There are no piles under those old caissons?—No, none.

152. Are the guide piles drawn?—Some of the guide piles are standing; none have been drawn round the sides.

153. Sir *W. H. Jolliffe.*] Do you find a greater quantity of materials to remove than you anticipated?—I find more stone thrown down to protect the piers.

154. When did the alteration take place of driving the piles for the foundations instead of screwing them?—At the commencement of operations with iron piles.

155. Then the whole have been driven and not screwed, as you proposed?—The whole have been driven, not screwed.

156. In your evidence before the former Committee you stated that you anticipated great advantage from screwing those piles?—The advantage of screwing the piles which I anticipated was safety to the old bridge.

157. You thought it would shake the foundations of the old bridge less by screwing than by driving?—I did so.

158. Was that the principal advantage which you anticipated?—It was the only advantage.

159. Will the difficulties which the contractor has met with in removing the foundations of the old bridge, make an additional expense under the contract?—To a slight extent. There was an allowance made to the contractor for cutting away those old foundations.

160. In addition to the contract?—It formed an extra under the terms of the contract.

161. Do you now anticipate that in removing the old bridge, you will find greater difficulties than you anticipated in the outset?—I do not; and in confirmation of my views, I may state that very able contractors, the Messrs. Cochrane, of Woodside Iron Works, have undertaken or are willing to undertake to complete the contract, to finish the whole of this portion, that is the first portion of the bridge, 33 feet wide, in 12 months, and to remove the old bridge, and to complete the new bridge, in two years from the time of the first part being open to the public.

162. Sir *John Shelley.*] By what authority was the alteration made of the piles being driven, instead of screwed, as required by the Committee?—The authority that the engineer has in the contract, to make alterations under the contract.

163. Is that without reference to the Chief Commissioner under whom he acts?—He has that power.

164. Colonel *Boldero.*] What would be the saving of expense by driving instead of screwing piles?—I cannot state it off-hand, but it would be a saving of expense to the department.

165. Sir *John Shelley.*] Do I rightly understand that such a material alteration as that could take place without the sanction of the authorities, by the mere word of the engineer?—It is not a material alteration. The engineer, in a matter of detail like that, would give his directions, if he saw that there was an advantage in it. It is a mere deviation in detail.

166. Supposing a Committee of this House had come to a determination mainly upon the ground of the security which they thought the screwing of those piles would afford, do you consider that after that the engineer, without any further communication or authority, would be authorised to make that alteration?—If the Committee had based its conclusions upon that condition, I apprehend he would not deviate from it.

167. But in your evidence before the Committee, were you not asked questions as to the principle of the construction of the bridge?—I was.

168. Was not one of your reasons for doing away with coffer-dams and other matters, that the principle upon which your system of foundation was based was the piles being screwed instead of driven?—Not the principle. I contemplated screwing the piles down in the proximity of the old bridge, and there only, but I did not regard myself as bound to that, or that I was bound not to vary any part of the works, and I provided for driving or screwing in the specification. In all works matters of detail must be left to the engineer.

169. Did you not before the former Committee state that that was one of your principles of construction, upon which that Committee came to its conclusion?—I stated that if I were the engineer for the bridge, I should screw the piles down; but I stated at the same time that I was not aware who would be the engineer to the bridge.

170. Did you not state that the question of screwing the piles, and thereby doing away with coffer-dams, was a very important one with reference to the estimate?—Not "thereby doing away with the coffer-dams," because the coffer-dams would be done away with whether the piles were driven or screwed.

171. Sir *W. H. Jolliffe.*] Am I right in understanding you to state that having cut through various of the foundations of the old bridge in the present state of the bridge, as the works are now suspended, it is in a less safe condition than it was before you commenced?—That is the fact; because the caisson being cut, the extent of bearing is diminished.

Alfred Austin, Esq., called in; and further Examined.

172. *Chairman.*] YOU came into the Board of Works last November?—Yes.

173. When you came in, the works at Westminster Bridge were in progress?—Yes.

174. Will you state when you first heard of their being stopped, and whether you can give us any information as to the cause of that stoppage?—I knew of the circumstance of the works being stopped at the time it took place, on the 19th of March.

175. Did you know anything before that of any negotiations going on respecting the stoppage of the works?—There were no negotiations going on respecting the stoppage of the works before that, except to this slight extent,

A. Austin, Esq.

11 July 1856.

that after certain negotiations had been brought to a point, the assignees of Mr. Mare, the contractor, requested to know whether the works might be stopped; and the reply of the Board to them was, that they had no objection, but that they could not take possession of the works until the valuation should be completed, the terms agreed upon, and the necessary assignments and other documents perfected.

176. What led to these negotiations of which you speak?—The bankruptcy of Mr. Mare was the primary cause of those negotiations, no doubt.

177. When did Mr. Mare's bankruptcy take place?—In September last.

178. After his bankruptcy took place was there any partial suspension of the works, or did the assignees continue the works without interruption?—I think without interruption, up to the time I mention, the 19th of March.

179. Was the first application respecting the suspension made by the assignees, or was it made by the Board of Works to the assignees?—It came from the assignees.

180. What was the nature of the application?—At that time the negotiation to which I referred just now had come to this point, that an offer was made and accepted for referring the question of the value of the works of the bridge and the materials upon the bridge to a referee, the Board undertaking to pay the amount of the award of that referee. Upon that agreement being come to the assignees then wrote to the Board, stating that it was desirable to stop the works, and requesting that an early day might be fixed for so doing.

181. Will you tell us what led to the negotiations with respect to this reference for ascertaining the value of the works; was that the commencement?—Yes. For that purpose I will read a communication which was made to the Treasury, which details the circumstances; it is dated the 23d of February.

182. You say that the bankruptcy took place in September; did nothing pass between the assignees and the Board of Works before February?—Yes; the report which I am about to read sets forth all the circumstances. This is from the First Commissioner to the Lords of the Treasury.

My Lords, Office of Works, &c. 23 February 1856.

I BEG leave to bring under your Lordships' consideration the present state of the proceedings in regard to the erection of a new bridge at Westminster.

The whole of the circumstances under which a contract was, with your Lordships' sanction, entered into by this Board on the 18th October 1854, with Messrs Mare & Co., for the execution of this work are stated in the accompanying printed return, made by your Lordships to the House of Commons on the 28th June 1854.

In pursuance of that contract Messrs. Mare proceeded with the work, under the superintendence of Mr. Page, the engineer for this department, upon whose certificates advances of money were from time to time made to the contractors by this Board in respect of the work performed and materials supplied by them. Money was also advanced by the Board, with a view of assisting the contractors in their undertaking, beyond the amount of the instalments which, under the terms of their contract, they were strictly entitled to receive.

Soon after my appointment, at the close of the month of July last, to this office, Messrs. Mare applied for further advances, which I declined, being unwilling to interfere with the contract as I found it, and feeling satisfied that the advances already made were of a most liberal character, in which conviction I am now fully confirmed by a report from Messrs. Rendel and Simpson, to which I shall hereinafter more particularly refer.

In the month of September last Messrs. Mare became bankrupt, and on the 6th December the assignees of the estate applied to me to be relieved from the contract for the new bridge on fair and equitable terms.

In reply, on the following day, I informed them that I should be ready to consider any proposals which they might offer upon the subject.

They thereupon, on the 13th December, stated their willingness to abandon all interest in the contract, and all monies payable in respect of works up to that date, together with all materials, plant, and machinery then on or about the works, on payment of the sum of 13,000 *l.*

This proposal at the time I thought it right to decline, which I did by letter, dated the 20th December; but the great importance of bringing this undertaking to a successful termination, and the difficulty and risk of having the work carried on by a bankrupt estate, were considerations which made me think it advisable to take the counsel of eminent engineers unconnected with this department.

I accordingly called in the aid of Mr. J. M. Rendel and Mr. J. Simpson, and requested them, in an interview which I had with them, to visit the structure, to report fully upon all points in relation to the contract, the nature of the works, and all matters relating thereto, and to advise as to future proceedings; and I instructed Mr. Page to put himself in communication with those gentlemen, and to afford them all the information and assistance in his power in the prosecution of their inquiry.

A few

A. Austin, Esq.

11 July 1856.

A few days after these instructions were given, I received another proposition by letter, dated the 18th January, from the assignees, to the effect that they should be allowed to dispose of the contract to Mr. Campbell, the engineer employed by Mr. Mare, who was willing to purchase it from them, provided that most extensive modifications specified by him were made in the terms of the contract, which he considered to be too stringent.

This proposition I referred to Messrs. Rendel and Simpson, and by their advice, contained in a letter, dated 30th ultimo, declined to accede to it. These gentlemen, after considering all the difficulties of the case, especially in regard to the inexpediency of permitting such a work to remain in the hands of a bankrupt estate, recommended a negotiation with the assignees on the basis of their former proposal. I, therefore, called upon the assignees, by letter dated the 1st instant, to state distinctly the property which they proposed to hand over to this Board for the sum of 13,000 *l.* required to be paid to them according to that proposal.

They replied to that letter on the 2d instant, and subsequently, on the 13th instant, furnished an inventory of the plant, materials, &c., proposed to be given up, with extracts from Messrs. Mare's books, showing the price paid by them for the same, and stated that to the sum of 13,000 *l.* above-mentioned must be added a further sum of 3,000 *l.* for work done and materials supplied since their proposal was made.

I transmitted a copy of this communication to Messrs. Rendel and Simpson on the 14th instant, and I have this day received their report on the whole of the matter referred to them.

From that report (a copy of which, together with copies of all the other correspondence on the subject, is annexed hereto), your Lordships will see that Messrs. Rendel and Simpson recommended that

I. An offer should be made to the assignees to take the work out of their hands, including the plant, paying, in addition to the amount already paid, such further sum as the permanent works executed since the date of the last certificate on which payment was made to them shall amount to.

II. That in the event of that proposition being declined, this Board should cause a valuation to be made by a competent engineer of the permanent works done, the materials delivered, and the plant; and if the gross amount of this valuation should exceed the amount paid to the contractors, that the surplus should be paid to the assignees.

III. And that this proposition failing, the Board should, without delay, instruct their solicitor to take possession of the works, stock, and plant under the provisions of the contract, and leave the assignees to their remedy.

I am of opinion that, under the very difficult circumstances of the case, and with such advice, it would be proper to submit to the assignees the first proposal suggested by Messrs. Rendel and Simpson, and in case of refusal, I shall be prepared to follow the course subsequently suggested by Messrs. Rendel and Simpson, or to act under the continued advice of those gentlemen, unless otherwise instructed by your Lordships.

As the matter is of great importance, I beg the early attention of your Lordships to it.

I am, &c.

The Right Honourable the Lords Commissioners of Her Majesty's Treasury. (signed) *B. Hall.*

183. In the early part of that letter a report is alluded to of Messrs. Rendel and Simpson; have you that report here?—Yes (*producing the same*).

184. Will you read it?—

[*The same was read, as follows:*]

Great George-street, Westminster,
21 February 1856.

Sir,

WITH reference to the correspondence upon the subject of Mr. Mare's contract for the new works at Westminster Bridge, we beg to report that we have attentively considered the questions you were pleased to refer to us, and we now submit the following observations for your information.

We find that the contract amounted to £. 206,438

And that the following payments have been made on account of—

	£.	s.	d.	£.	s.	d.
Works executed	18,004	18	4			
Materials delivered on wharves, &c.	26,608	14	11			
Additional and day works	1,687	19	4			
Contingencies, viz.—						
Surveyor's charges	1,893	17	4			
Maintenance of old bridge	1,000	–	–			
Sundries	8,397	11	1			
	11,291	8	5			
Cash payments to 1st February 1856				57,593	1	–

A. Austin, Esq.

11 July 1856.

We consider the advances on account of the materials on the wharves, &c., to have been extremely liberal under the provisions of the contract; and with respect to the advances on account of contingencies, it seems to us a large portion of these appertain to the whole contract, although only about one-tenth of the amount of the permanent works has been executed.

After much deliberation on the subject, we recommend that an offer be made to Mr. Mare's assignees to take the work out of their hands (including the plant), on an early day to be named for the purpose, paying in addition to the amount already paid, such further sum as the permanent works executed between the last certificate and that day may amount to, made up by Mr. Page in the same manner as his former certificates.

In the event of this proposition not being accepted promptly, we then recommend that there should be prepared by a competent and independent surveyor, properly instructed, three bills, thus—

First. For the permanent works executed to the engineer's satisfaction, based on actual measurement, the quantities so ascertained being priced at the contract schedule.

Second. For the materials delivered, so far as the same are approved by the engineer, valued at their actual worth, or in other words at such prices as would admit of their transfer to a new contractor without loss.

Third. For the plant, the same being computed at its present value for the works, and consequently such as it could be charged at to a new contractor without loss; and

Should the gross amount of these three bills exceed the sum already paid to the contractor, we are prepared to recommend that the balance be paid to his assignees, of course not as legally due, but in consideration of their facilitating any course the Commissioners may decide on as best in regard to the works, and also from a wish to deal liberally with the creditors.

This alternative proposition failing them, we think the Commissioners should, without delay, direct their solicitor to take possession of the works, stock, and plant under the provisions of the contract, and leave the assignees to their remedy.

Upon a review of the whole case and its attendant circumstances we beg to state that, in our opinion, it is not only expedient, but extremely desirable the Commissioners should obtain early possession of the works, our decided conviction being, that it will be found impossible for the assignees to carry them out to completion under the contract.

We have, &c.

(signed) *Jas. M. Rendel.*
James Simpson.

The Right Hon. Sir B. Hall, Bart.

185. In consequence of those proceedings and negotiations of which you have spoken, was any agreement come to by the Board of Works with the assignees of Mare?—There was.

186. What was it?—The agreement was this, that the second proposition recommended by Messrs. Rendel and Simpson should be accepted.

187. What was the result?—The result was this report from the surveyor (*producing the same*).

188. Who is the surveyor?—Mr. Charles Stephenson, of 4, Parliament-street.

189. Will you read it?—

[*The same was read, as follows:*]

Sir, 4, Parliament-street, 14 June 1856.

I HAVE prepared the three bills referred to in your letters of the 18th and 22d of March last, Nos. 2,596 and 2,677 respectively, with reference to the New Westminster Bridge, and have now the honour to report my valuation of each, as follows:—

	£.	s.	d.
Bill No. 1: The permanent works examined and approved by the engineer - -	32,166	1	6
Bill No. 2: The materials delivered, as approved by the engineer - - - -	28,957	3	-
Bill No. 3: The plant - - - -

190. In consequence of that report of Mr. Stephenson, was that transaction carried out with the assignees?—This report was forwarded to Messrs. Rendel and Simpson, who made their report on the 28th ult., which was presented to Parliament on the 30th ult. Mr. Stephenson's report has not yet been acted upon.

191. In whose possession are the works at this time; are they in the possession of the Board of Works or of the assignees?—Of the assignees.

192. Has anything further taken place since that between the assignees and the Board of Works?—No, I think not. We sent a copy of Mr. Stephenson's report to the assignees at their request.

193. Is it within your knowledge, at what time during the progress of these negotiations, either before or after the suspension of the works, doubts first begin to be entertained as to the wisdom of proceeding upon the plan of constructing the foundations of the bridge, which was then being carried out?—It strikes me that I heard of doubts soon after I was at the office.

194. Was any step taken by any one within your knowledge, to bring the matter before any professional parties?—Yes.

195. When?—On the 31st of March last, a letter was addressed to Messrs. Rendel and Simpson upon the subject.

196. You came into the office in November, and you say you soon afterwards found that some doubts were entertained upon the subject. Did nothing pass within your knowledge before the 31st of March upon the subject?—No written communication that I am aware of.

197. Was there any verbal communication?—Yes; the First Commissioner had interviews with Messrs. Rendel and Simpson, and a letter was addressed to Mr. Page on the 16th January, after some of those interviews, desiring him to meet those gentlemen on the subject of the bridge.

198. Will you state the result of those verbal communications which were within your own knowledge?—The final result of those verbal communications was that this letter which I have in my hand was drawn.

199. Will you read the letter?—This is to Messrs. Rendel and Simpson.

[*The same was read, as follows:*]

Gentlemen, Office of Works, &c., 31 March 1856.

I AM directed by the First Commissioner of Her Majesty's Works, &c. to inform you, in reference to your letters of the 11th and 17th instant, that, acting under your advice, he has placed the final settlement of the question between the assignees of Messrs. Mare and this Board, respecting the works and materials at the New Westminster Bridge, in the hands of Mr. Stephenson, in the terms set forth in a letter addressed by me to him on the 18th instant (a copy of which is herewith sent to you), the assignees having approved of that gentleman as referee.

Mr. Page states that the works will be stopped forthwith; it is therefore probable that they will remain in abeyance until they pass into the hands of this department, which you considered to be unimportant.

Your attention has been already directed to the necessity of determining, with as little delay as possible, what shall be done in relation to future operations. It is upon that point I request your early and earnest consideration.

It appears that the plan to be adopted in the construction of the new bridge was considered before a Select Committee of the House of Commons on the Westminster Bridge Bill, in the year 1853, and that it was to be as follows, viz:—

One half of the new bridge was to be built first, and, when completed, to be opened for traffic, and the existing bridge taken down, after which the other half was to be built; and the two halves, thus erected at different periods, were to be so built as to be fitted to and united with each other, and then the whole was to be thrown open to traffic.

There were also various contrivances of a novel character for setting in and forming the foundations of the new structure, all of which appear to have been considered with a view to avoid the necessity of providing a temporary bridge, and the usual coffer-dams.

The estimated cost of the bridge was 224,208*l.*, exclusive of the cost of dredging the river to the depth of 12 feet below the level of low water to a distance beyond the limits of deviation shown on the Parliamentary plan, of concreting round the piers, and of providing floating fenders, such cost being estimated at 10,792*l.*, making the total estimated expense 235,000*l.*, as set forth in a report from Sir William Molesworth to the Treasury, dated 19th April 1854 (*vide* Parliamentary paper, No. 335, Session 1854), and the bridge was to be completed by the month of May 1857.

Such being the facts of the case, the First Commissioner requests that you will report to him upon the following points:—

1. The cost of the works up to the date of your report, or as near to that period as you can.

A. Austin, Esq.

11 July 1856.

2. The progress which has been made in the work.
3. The time in which the first half of the bridge may be made ready for traffic.
4. The time necessary for the completion of the whole structure, and its probable cost under existing circumstances (also the probable cost of suitable approaches).
5. Your opinion as to the original scheme, and the exact nature of that scheme; and,
6. The desirability of proceeding with it.

Should you be unfavourable to the prosecution of the present plan, I have to request that you will set forth most fully the reasons which induce you to arrive at such a conclusion, and that you will advise as to the course which you think it would be most desirable to adopt, taking into consideration all the various circumstances of the case, and bearing in mind that the object to be attained is to have a bridge of a permanent character.

I am, &c,
J. M. Rendel, Esq. (signed) *Alfred Austin*,
James Simpson, Esq. Secretary.

200. I understand you to say that that letter was the result of verbal communications that had passed, not between yourself and Messrs. Rendel and Simpson, but between the Chief Commissioner and those gentlemen?—Yes. I had instructions for preparing that letter, which was the result of previous interviews between Messrs. Rendel and Simpson and the Chief Commissioner, at which I was generally present.

201. We may consider that letter to have been an official statement of matters which had been communicated upon before verbally between the Chief Commissioner and Messrs. Rendel and Simpson?—Yes, I believe it may be considered so.

202. Then in consequence of that letter the report which has been put in by Messrs. Rendel and Simpson was made?—Yes.

203. Was there any other report from those gentlemen after that letter besides that which has been put in here?—I think not; not until the report made by Messrs. Rendel and Simpson, which has been presented to Parliament, except upon one or two smaller collateral matters that arose.

204. Sir *John Shelley.*] I understand you to say that the second recommendation made by Messrs. Rendel and Simpson was accepted by the assignees; was there any other offer made?—The first was rejected by the assignees. I am now able to state the exact time when I first had an intimation that the bridge was not in a satisfactory state. It was within two or three days after the 5th of January, upon the return of the Chief Commissioner from the country after the Christmas holidays.

205. Mr. *Tite.*] That was the first time that your attention was called to it?—The First Commissioner stated to me that he had received information that the state of the bridge was not satisfactory, and that he intended to communicate with Messrs. Rendel and Simpson upon the subject. That was two or three days after the 5th of January. He saw Mr. Rendel on the 8th, and after some interviews with Messrs. Rendel and Simpson, on the 16th of January a letter was written to Mr. Page, requesting him to give to those gentlemen assistance in their inquiry. The letter is as follows: "Office of Works, 16th January 1856. Sir,—I am directed by the Chief Commissioner of Her Majesty's Works, &c., to inform you that he has considered it advisable to have the works of Westminster Bridge examined by some eminent engineers. He has therefore directed Mr. Rendel and Mr. Simpson to visit the structure, and to report to him fully upon all points in relation to the contract, the nature of the works, and all matters relating thereto, and to advances and future proceedings. I have therefore to request that you will put yourself in communication with those gentlemen, and afford them all the information and assistance you can in the prosecution of their inquiry."

James Meadows Rendel, Esq., and *James Simpson*, Esq., called in; and Examined.

J. M. Rendel, Esq. and *J. Simpson*, Esq.

206. *Chairman.*] (To Mr. *Rendel.*) YOU and Mr. Simpson are civil engineers?—We are.

207. It has been stated to the Committee, that the letter of the 31st of March, which you have just heard read, was sent to you from the Office of Works?—Yes.

208. Does

208. Does that letter contain a correct representation of the matters which had been conferred upon by you and the Chief Commissioner of Works beforehand, with reference to this subject?—It does.

J. M. Rendel, Esq. and *J. Simpson*, Esq.

11 July 1856.

209. In consequence of that letter, did you make the report dated the 28th of June 1856, of which I now hold a copy in my hand?—We did.

210. In that report, among other matters, the fifth article is that the original scheme, in your opinion, is defective in many of its details, more especially in the construction of the piers below water?—It is.

211. Do you wish to make any statement to the Committee, beyond what this printed document contains, with respect to the reasons which induced you to come to the conclusion that the scheme is defective in this particular detail, in the construction of the piers below water?—No further than this, that our particular reasons for coming to that conclusion are, that looking at the great changes that are taking place in the depth of the Thames, commencing from the period when Old London Bridge was removed, and continuing up to the present moment, and which are almost certain to go on, which changes imply the removal of nearly all the gravel of the bed of the river down to the London clay, seeing those changes, and that this bridge is founded upon the principle of a composite pier between the level to which we believe the Thames will ultimately deepen its bed, and low water, a depth of between 12 and 13 feet, we consider that the foundations are not of that permanent character which it is all-essential in our judgment that a metropolitan bridge of such importance as Westminster Bridge should be. We felt that this conclusion was justified by the subsidence which has taken place in Blackfriars Bridge, which although not piled with bearing as Mr. Page is piling Westminster Bridge, was considered, from the circumstance of its having bearing piles, a safe bridge; and when Westminster Bridge began to sink, it was repaired at a very enormous cost under the idea of Blackfriars being a safe bridge, from the fact of its having bearing piles. Seeing that Blackfriars Bridge has begun to subside notwithstanding those bearing piles, and knowing as we do all the attempts that have been made to keep up Westminster Bridge (a thing impossible, as the results show), we came to the conclusion that, to make the piers of the new bridge unquestionably secure, it was desirable to resort to the old mode of cofferdams, and to found the piers upon the London clay at such a depth as would make their footings safe beyond all question, whatever might be the deepening of the river; and we felt that the more, because we cannot but regard the improvement of the Thames as a navigable river of the utmost public importance, and we felt that anything done to uphold any bridge, more especially a modern bridge, that would occasion interference with the deepening of the bed of the river, was injudicious. We consider that the river should be encouraged to improve itself, not only as a drain, but as a navigation; it is all-important as a navigation. Therefore we did feel that the mere circumstance of these piers requiring, in the estimation of the engineer, a deposit of concrete on the outside of these cases of iron, as a means of preventing the river from deepening its bed close to the piers, was a very objectionable thing; and that it would be a safer and better arrangement for a bridge of this importance to obtain security by founding the piers at such a depth as should place them out of the reach of any scour that could take place in the bed of the river.

212. Has experience proved that the plan of putting foundations in at such a depth as you have stated, beyond the reach of any change in the bed of the river, is, as far as human knowledge goes, a plan which gives permanent security?—Clearly.

213. Is the plan suggested here one with respect to which your knowledge and information would lead you to the belief that it would not be secure?—I should be sorry to say that failure would be certain; I am not prepared to say that; but I am just as unprepared to say that success will follow this construction, even at present. My own opinion is this: that with the other bridges I have referred to showing symptoms of rapid, I might say of immediate decay, from the deepening of the bed of the river, I think any new bridge built across the Thames should be put beyond the reach of danger from the like cause.

214. The plan to which you have referred, of putting concrete round the outside of the piers, is an evidence, is it not, as far as that goes, that this species of construction is improved by that sort of artificial support?—No doubt; the intention is to prevent the river from deepening its bed close to the piles to

J. M. Rendel, Esq. and *J. Simpson*, Esq.

11 July 1856.

the same extent as it might deepen in the middle of the arches. But my experience tells me that however carefully we may guard these piers for a time, very shortly after the bridge is built, and everything is supposed to be perfectly safe, all of these precautions and adjunct supports will be forgotten and neglected, and things then go wrong; for these reasons, I say again, my own idea is that a bridge of this importance ought to have solid stone piers carried down deep into the London clay.

215. Have you had personally much experience in bridge building?—A good deal; and I have had a good deal of experience in the docks about the river; so that I am perfectly conversant with the nature of the bed of the Thames and of the London clay.

216. The plan upon which this bridge is proposed to be carried on is by building it twice; that is to say, half of the bridge is to be built longitudinally at one time, and when that is completed, the old bridge is to be taken down, and the other half built to it?—That is the proposition.

217. In your opinion, does the carrying on a work in that manner, at twice, render the putting the piers in this way more or less secure?—I think they are less secure; my opinion is that if the bridge be built in two parts, even if it stood upon new ground, it would be better to build each part as a separate bridge, and simply to make the connexion at the roadway, where if settlements should occur, the only inconvenience arising from them would be that you would have to reform the surface of your road. I certainly would not build a bridge even, as I said before, on new ground, unless it was on rock, I would not build a bridge in two parts, and bond the parts together. I should build each separately, and simply connect them at the roadway, because it is impossible unless you have rock for the foundation that you can have equality of settlement.

218. Within your experience have you ever known any bridge of the size and importance of Westminster Bridge, or a bridge over a river of this character, built in the way in which this is proposed to be built, in two parts?—I have not.

219. Have you ever heard of such a thing?—I have not.

220. If I understand your opinion rightly, it is this: you say you will not go he length of saying that such a mode of creating foundations cannot stand and be secure, but that in your own judgment it would be more wise, in building a bridge of this importance in such a position, to adopt the plan which long experience has shown to be more to be depended upon for permanent security?—I think so.

221. Is it within your knowledge that any considerable bridge has been built in any tidal river upon piers of anything like the description of those which are proposed to be constructed upon this occasion?—It is not.

222. Sir *W. H. Jolliffe*.] Is it your own opinion that, supposing this work to proceed, it would be better now to finish the part of the bridge that is commenced as a separate bridge rather than to endeavour to connect it with what is to be built?—Decidedly.

223. Therefore you would now finish that as a separate bridge, and divert the traffic to that bridge, and then build another separate bridge, and connect them at the roadway?—If I was required to finish the present design, I should adopt that plan; I should make the two parts perfectly distinct excepting at the roadway.

224. Supposing the design which is now attempted to be carried out had in the first instance been submitted to you, before the Board of Works approved of it, would you have sanctioned the plan as at present designed?—If I was to be made professionally responsible, I would not recommend so novel a construction for so important a bridge.

225. Therefore if you had been called upon to make a report upon it, you would have felt yourself unable to sanction such a construction?—Certainly. My experience tells me that piling in London clay does not always improve it. The London clay is generally so exceedingly compact and solid, that I have often found piling break it up rather than strengthen it; piling therefore should not be resorted to, in my opinion, except in cases where they are shown to be necessary by boring.

226. And you say that two bridges would be a preferable construction to one bridge, as now designed, even upon new ground?—I should say so.

227. When you use that expression, do you mean that you consider the ground occupied by the present Westminster Bridge as less eligible for the construction

construction than new ground would be?—I think so; I think that all those portions of the new bridge piers which will stand upon the sites of the piers of the present bridge, will stand upon a comparatively different description of foundation from that upon which the other piers will stand. The bed of the river has been greatly disturbed in all the attempts to keep up the old bridge, and I apprehend that there will be a very considerable necessity for a difference of treatment there.

228. Do you consider that it will also entail great expense in forming good foundations?—I think so; and I think that the amount of that expense will be very uncertain; with coffer-dams you can calculate the expenses, but with tide work, dealing with such ground as we have here, my experience tells me that we cannot calculate the cost of the work in money or in time.

229. But that would be more easily calculated upon a new site, than upon a site of this description?—Clearly so. The works that have been done in the effort made to keep up Westminster Bridge, and the quantity of stone that has been thrown down in all parts of the bed of the river, round its piers, will cause very great difficulty when the new bridge comes to be built upon those portions of that site of the old bridge where the foundations are in common.

230. Have you any data to show what has been the deepening of the river of late years?—We have very good data; and I believe no one knows more upon that subject than the engineer of Westminster Bridge, Mr. Page. He has written a great deal upon the subject, and he will give very complete information about it; I have collected the data. I did not bring the papers here to-day, not expecting to be called, but I will have them at the next meeting if the Committee wish; but the changes in the river have been very great indeed.

231. Are there published reports upon the subject with diagrams?—There are; but as regards those changes, they have gone on in defiance of what has been done, and which, if it had not been done by public bodies, would have been called nuisances, that is, throwing large quantities of stone into the bed of the river, an evil which cannot be allowed to be continued.

232. These changes in the river have been much more rapid since the removal of Old London Bridge?—They have been entirely due to the removal of Old London Bridge.

233. Do you think that the bed of the river around the foundations of Westminster Bridge will be still further affected considerably, supposing the materials around the base of Blackfriars Bridge were removed?—Very greatly. I believe if you remove the obstructions and allow the various bridges to take their chance, which you ought to do if you consider the navigation as important, you would have the bed of the Thames through London scoured down to the original bed of clay.

234. And of course the navigation of the Thames is important, and must be every day becoming of still greater importance, in consequence of the increase of population and the increase of traffic?—No doubt.

235. Has not the invention of steamers also rendered the navigation of the river more important?—The crowding of the streets has rendered the navigation a great deal more important; and the removal of Old London Bridge has made the river a most important highway. We know how warehouses are springing up on the banks of the river in every direction, and competing with the docks. That is due to the improvement of the river. So that looking at all the circumstances of the case, the improvement of the navigation is very important.

236. Do you contemplate at all that steam docks may be constructed above London Bridge?—No; I think not. But you may have the river greatly improved as a thoroughfare, much to the relief of the streets of the city and of Westminster.

237. Sir *John Shelley.*] With regard to the river clearing itself as you contemplated, in what way is the clearing of the river likely to take place, unless the bed of the river is deepened at its mouth?—Up to London Bridge the average rise of the bed of the river, for many miles, is about six inches to a mile; above London Bridge it becomes very much more; and the effort of the river is to equalise the inclination of its bed. The current is now so contracted by the various constructions on each shore, that the gravel is gradually being scoured away; and if you have a Thames embankment at any time, you are sure then to increase the scour to such a degree that the gravel cannot but go;

J. M. Rendel, Esq. and *J. Simpson*, Esq.

11 July 1856.

go; I do not mean entirely, but it will go to a very great extent, particularly at the bridges.

238. With regard to the alteration, which appears to have been in the plan, by driving the piles into the clay instead of screwing them, as originally proposed before the last Committee, what is your opinion as to that alteration?—I think that screwing the piles into the London clay, if it had been possible, would have destroyed the foundation. At Portland, we are using screw piles to a very great extent; and we cannot possibly get any screws more than about five feet into the clay, not so strong as the London clay.

239. Mr. *Tite.*] Supposing the bed of the river should remain permanent, such as it is, are you of opinion that in that case the proposed mode of construction would be a safe one; does the difficulty which you apprehend with regard to the foundation upon this plan arise from the belief which you have that the bed of the river will very much deepen, or is your objection an objection in point of principle altogether?—It is an objection to the principle, very much increased by my conviction as to the deepening of the river. I cannot draw any analogy between a foundation formed on piles cut off in the London clay, and then covered by a strong grating of timber, such as there is in London Bridge, and a series of piles standing up in the way these do, because here there is no uniform distribution of the weight to be carried. Again, supposing the iron casing to be perfectly sound, though there is great difficulty in making it sound below low water, where you cannot see what you are doing; but even supposing it to be perfectly sound, the concrete which is brought up from the gravel will be liable to disturbance by the least settlement, or the concussion of barges. In fact I apprehend that there would be no certain uniformity of bearing.

240. By this mode of construction, do you imagine that the weight of the pier itself is thrown fairly upon its granite casing, which is of thin ashlar, with the iron plates below?—I looked at that; I think not. I think that it would have been better, supposing this principle to be acted upon, to have had an iron casing perfectly independent of the weight of the bridge; so that the weight of the bridge should really have been carried solely by the wood piles. But here the principle that the engineer has adopted is, that the weight of the bridge should be carried partly on the iron piles and partly on the wooden piles. The iron piles act as bearing piles as well as a casing.

241. With respect to the scour, you spoke of the probability of the bed of the river deepening 12 or 13 feet; but of course there must be some end to this deepening; what should you say would be the limit to the scour?—I doubt very much, unless the river be unduly narrowed, whether the river will be able to deepen its bed below the natural surface of the clay, although there is a great increase in the quantity of tidal water passing up the river.

242. Has not it something to do with the outfall; will it not be controlled, in some measure, by the level of the outfall?—It has to do with the bed of the river at some distance below London Bridge undoubtedly; but the bed of the river for some distance below London Bridge has an inclination of six inches to the mile; whereas above London Bridge the inclination is very considerably more. I have not the sections with me.

243. Do you mean that the outfall would or would not act as a dam?—The outfall will not act as a dam; I think the effect will be this, that we shall have the sea low water brought gradually further up the river. We know that at the East and West India Docks we have the tide now falling from a foot to 14 inches lower than it used to fall; and we have it rising considerably higher also.

244. Do you think that is due to the state of the alluvium at the mouth of the Thames?—I think it is due to the removal of old London Bridge, and the consequent admission of a larger volume of tide, and consequent increase of scour in the upper reaches of the river.

245. Then it is your belief, in conjunction with Mr. Simpson, that the scour will go on so as to deepen the river to the extent of 12 feet or 13 feet below what we now find it?—I think the bed of the river at Westminster will come down to 12 feet below the present low water, which is just the level of the clay.

246. Which is shown upon the plan before the Committee?—The engineer has anticipated such deepening by proposing to dredge out between the arches to the London clay.—(Mr. *Simpson.*) The extent of dredging below

bridge

bridge of late years has been very considerable; some large shoals have been removed; and we have observed rather higher up the river, about two miles from this spot, that the ebb tides have gone considerably lower. Comparing the present time with 25 years ago, we have the ebb frequently 3 feet 6 inches lower than it was then.

247. Within your experience?—Yes.

248. With regard to Blackfriars Bridge, and the failure there, have either of you gentlemen had any opportunities of practically observing the works done at Blackfriars Bridge?—(Mr. *Simpson.*) Yes, I was several times in the dams.

249. It has been suggested that the cause of that failure was, that the dam piles were torn up rudely and violently, causing large excavations round the foot of the pier, into which the soil slipped; is that the case, in your opinion?—I think that is very probably a partial cause; but, in my opinion, the cause has been that there has been a considerable scour in consequence of the changes produced by the dredging even below Westminster Bridge, and that whatever may be due to the removal of the dam piles, a great deal is also due to the scour of the river, and the consequent deepening.

250. Were complete coffer-dams put round all the piers at Blackfriars Bridge?—Yes, very complete dams.

251. Was it under-pinned, or in what way was it secured?—It was partially under-pinned; but a series of beach piles, about 11 to 12 feet thick, were driven, perhaps the best bit of piling that was ever done; they were glued joints almost, they were so well put together, and a very perfect job it was; it was one of the best jobs of piling of that character that I ever saw.

252. Yet in spite of that it went afterwards?—It did.

253. With regard to Westminster Bridge; when Mr. Walker widened the piers had he coffer-dams?—Yes, very perfect dams: the Westminster Bridge dams that Mr. Walker put in were some of the tightest dams I ever saw; they required very little pumping indeed from them; but I observed in both cases that there was a settlement in both structures, and in Blackfriars Bridge it was more marked than in Westminster Bridge; every cutwater separated; I could see the settlement, clay tolerably tight; the pumps keep them free; when the water-way is free there is a compression.

254. (To Mr. *Rendel.*) Are you aware that Sir John Rennie, in constructing the new London Bridge, where he had coffer-dams, and had the whole surface of the river bare, still had bearing piles?—He had also a very perfect platform of timber resting on the piles; I think the want of this platform is a material defect in this new mode of construction; without it the piles are not tied together, and the weight distributed; I think, that however well you may surround them with concrete, they are not so capable of bearing the weight as if united by a platform of solid timber.

255. Do you imagine that if, after the thing is constructed, one of those piles gave way, any ill consequences would follow?—Yes; and I apprehend that, even if the piles remain perfect, the tremulous motion (for we must, I apprehend, have some motion in these piles if the gravel or concrete should be disturbed), will materially affect the stability of the pier.

256. (To Mr. *Simpson.*) Do you agree in that?—I do. (Mr. *Rendel.*) You want stability in all parts of a bridge of such enormous traffic, more particularly in the lower parts of it.

257. Sir *W. H. Jolliffe.*] And you would depend upon nothing but solid masonry?—Certainly; admitting that the principle upon which this plan proceeds is good, still I should say that so far from its being a principle that admits of dispensing with coffer-dams, it would be better for the carrying out of the principle itself to have coffer-dams. The fastening of those iron ties, and jointing the cast iron plates, are very important parts of the plan; and I should say from a good deal of experience in tide-work, that it is the most difficult thing in the world to depend upon divers; you should not trust to their care in such important parts; the men mean to do right, but they do not feel the responsibility of their employers.

258. Mr. *Tite.*] Do you know the wharf wall constructed at Adelaide Wharf, and another at Blackwall?—I know the Blackwall.

259. That is dry, at low water, is not it?—No, I think not; I think there are several feet of water at low water.

260. Did you see it during its construction?—Yes; I know it very well.

J. M. Rendel, Esq. and *J. Simpson*, Esq.

11 July 1856.

261. Do you think the analogy which has been drawn between that work and this a fair one?—I think not.

262. Why not?—I think in the first place a wall may be protected by a variety of means, if it shows the smallest symptom of settlement; whereas the pier of a bridge cannot. The pier of a bridge is liable to a variety of casualties to which a wharf wall is not.

263. Do you know the Adelaide Wharf at London Bridge, which is of the same character, and upon the edge of which very heavy warehouses stand?—I do not.

264. You do not know that that wall has 14 feet water at low water?—No, I do not.

265. Sir *John Shelley*.] With regard to Blackfriars Bridge, is that built on the London clay?—No, I believe not; I am not quite sure whether the piles pierce the London clay; but that bridge has bearing piles.

266. With regard to the reports as to the settlement in Blackfriars Bridge, are you aware that that is supposed to have grown worse since the building of Pounsford's flour mills close by?—No, I am not. (Mr. *Simpson*.) The failure of the bridge is not going on on that side of the river.

267. (To Mr. *Rendel*.) We have heard the correspondence which took place between the Chief Commissioner and yourself and Mr. Simpson with reference to the suspension of these works. Are we to understand that the suspension took place with your approval?—Clearly so, with a view to the settlement of the account with the bankrupt contractor, so that you might enter into a new contract with any other contractor. At that time no questions with reference to the construction of the bridge were referred to us.

268. You advised that the matter should be taken out of the hands of the assignees?—We did. We felt that that was the safest course with reference to the ultimate result.

269. Mr. *Tite*.] And without reference to any technical question?—Without reference to any technical question.

270. Sir *John Shelley*.] Do you consider that the alteration which took place as between the screwing and the driving of the piles had any material effect upon the construction of the bridge?—Not at all.

271. (To Mr. *Simpson*.) You have heard the evidence which Mr. Rendel has given upon the subject of the sufficiency of the proposed mode of constructing the foundations of the bridge. Do you agree generally in what he has stated upon that subject?—I do.

272. (To Mr. *Rendel*.) We will now go to the next article in your report, in which you state: "It will be prudent, in our opinion, to retain the site of the bridge, and, if a width of 85 feet is considered necessary, its general arrangement; but that the details of the design should be modified; and that, in particular, the piers and abutments should be of solid stone, carried down deep into the London clay." With regard to that recommendation, are we to understand your opinion to be, that if it was determined to carry this bridge on upon its present site and upon its present plan, modified by the piers being carried down to the London clay, you then advise in that case making two bridges side by side, and connecting them by the road-way instead of making one entire bridge?—Certainly. Then if you adopt that plan, you will be obliged to resort to coffer-dams and to build also a temporary bridge. By having a temporary bridge you would not only with your coffer-dams have the means of building the new bridge in the manner there recommended, but you would also have the means of taking up the foundations of the old bridge, which I confess I look at as a matter attended with some considerable degree of difficulty, unless dams are employed.

273. Do you consider that it would be absolutely necessary, if the plan were modified in the way you speak of by having solid stone piers carried down into the London clay, that there should be a temporary bridge, and that the new bridge should be carried out in one structure?—I think so.

274. What is your reason for that? Why should it not be carried out as is proposed in the present scheme, in two structures?—I do not think it would be possible to carry the foundations of the new part down to the depth proposed, so close to the old bridge, without considerable danger to it.

275. You think that the very circumstance of excavating the ground and carrying the foundations so deep as would be necessary in that case, would so endanger

endanger the foundations of the old bridge, as not to make it a safe proceeding?—I think so. At all events, the precautions which would be absolutely necessary to guard against accidents, would so nearly in their cost approach the cost of a temporary bridge, that both convenience and cost would be in favour of a temporary bridge.

276. In your judgment, if I rightly understand your report, considering as you do the present scheme to be defective, it is a logical conclusion from that opinion that the scheme should be modified either in the way which you suggest or in some other to make it effective; and in your judgment, to carry it out properly, would require a temporary bridge?—I think so, if there is to be a permanent bridge. Our instructions were to report upon the best mode of making it a permanent bridge. Now I attach, perhaps, considerably greater length of time to the term "permanent" than some people would do. I call "a permanent bridge" a bridge built for generations; and then, looking, as I said before, to making it a permanent structure, I should build solid stone piers, founded deep in clay, and built within coffer-dams, which coffer-dams would also enable us to entirely remove the old bridge, which would be an operation of considerable trouble, difficulty, and expense, if not removed in dams.

277. That being so, I understand you to state that you would not construct such a foundation as is now proposed for such a bridge if your professional responsibility were at stake for its proper security?—I would not. I quite concur in opinion with Mr. George Rennie and with Mr. Walker, and with various engineers who have in former years been examined upon the subject of the building of Westminster Bridge, that its safety will be best secured by carrying its piers deep into the London clay.

278. (To Mr. *Simpson*). Do you concur in that opinion?—Yes.

279. Mr. *Tite*.] (To Mr. *Rendel*.) Would it be possible to diminish the expense of the temporary bridge by doing as they did with London Bridge, building the bridge in two halves, not lengthways, but meeting in the centre, and making one half complete before they opened the other half?—It strikes me that there would just be a possibility of keeping up the old bridge till you got the new bridge, if you were to carry it, as I see by the Parliamentary Papers, Sir Charles Barry is so anxious for, at right angles to the façade of the Houses of Parliament, because, in that case, the bridge would leave the present site as it approached the Surrey shore; it would be so oblique to the line of the present bridge that you would be able to get in all but the two Middlesex foundations without disturbing the old bridge.

280. With regard to the removal of the piers of the old bridge, would you propose to put a dam quite round the pier, inclosing the site of the new pier as well as the old?—Yes; and I think that is a circumstance in favour of putting the new bridge immediately upon the site of the old one.

281. You would inclose the whole of the area which you have to disturb either by removing old or by putting in new?—Yes; but I would remove the whole of the arches of the old bridge before I began the new. The removal of the old bridge, I believe, is a matter of much more difficulty than has yet been considered. I believe it would be necessary, for the safety of the river, to put centres under the arches.

282. Colonel *Boldero*.] Do I rightly glean from your evidence that this is your opinion, that you would abolish the present plan altogether of constructing the foundations of the new bridge, and that you would construct it in a way that would make the foundations be much more solid?—Yes; my opinion is that if the bridge is to be a permanent bridge you ought to adopt solid piers, carried down deep into the London clay, which would be inconsistent with the present new works.

283. *Chairman*.] But inconsistent with the present structure only so far as relates to this plan of making the foundations of the piers?—Only as far as relates to the principle adopted by Mr. Page in founding these piers, a principle that enabled him to avoid the expense of a temporary bridge and of coffer-dams, for that has really been the object of Mr. Page's plan.

284. Sir *John Shelley*.] Looking at the whole of the circumstances of the case, and the difficulty and danger which you have stated there would be in pulling down the old bridge, what is your recommendation as to the best course to be pursued under all the circumstances of the case; do you recommend that the bridge should be continued, as settled by the last Committee, on the present spot, or do you consider that the better course would be to build

J. M. Rendel, Esq. and *J. Simpson*, Esq.

11 July 1856.

the new Westminster Bridge in an entirely new place?—I think that under all the circumstances the best plan of proceeding would be to retain the present site, and general character of the bridge; but in lieu of founding the piers in the manner now executing, to found them within coffer-dams, piers and abutments being brought up from 38 feet below Trinity high water.

285. Mr. *Tite.*] Not to change its architectural character?—Not at all; I see no reason for that. If I am to give a responsible opinion, that is the opinion which I am bound to give to the Committee.

286. If that was done, to what extent would the material which has been provided, and the value of which has been estimated by Mr. Stephenson, come in?—About 57,000 *l.* worth of material from the old bridge and the new bridge would come in.

287. And without a change of plan further than what you have stated?—Without any other material change of the plan.

288. Colonel *Boldero.*] Then the loss would not be heavy?—That would be the amount of the direct loss.

289. *Chairman.*] (To Mr. *Simpson.*) Do you agree in the last opinion which has been given by Mr. Rendel?—I have gone into the question of the strength of the bridge as regards the arches and everything, and I think there is ample strength.

290. Mr. *Tite.*] You think there is about 57,000 *l.* worth of material to come in?—Yes.

[*The following Questions were put by Mr. Page, with the permission of the Committee.*]

291. (To Mr. *Rendel.*) I understand you to say that you are of opinion that the concrete was put in with the view of increasing the security or stability of the piers?—Yes; and I think more than that, it would be very desirable with that mode of construction.

292. Then supposing this concrete to remain in its place, what danger do you apprehend to the pier?—My apprehension is this, that it would be quite impossible as a practical question for you to maintain any uniform line of bed to the river. We know perfectly well how readily rivers alter the course of their bed, and we know that it is very difficult, particularly under the arches of a bridge, to make the river retain any particular form unless you do it by coercive measures. My apprehension is, that the gravel would be scoured away, and the concrete would then begin to break up.

293. Is not that rather hypothetical; why should the gravel be scoured away, and why should the concrete break up; because, considering that the depth that would be given to the river would be greater than any depth that it has between Westminster Bridge and London Bridge, would not the tendency rather be to deposit at Westminster Bridge than to scour?—You appear to assume that the river will not improve its bed; now my conviction is that the river will go on improving its bed if it is allowed to do so, and that it should not be coerced at the various bridges that cross it. The opinion which I have formed is, that the river should be allowed to do with its bed as it likes, and that the bridges should be made perfectly independent of that operation.

294. Assuming that the river is dredged to the depth that it will ultimately take, that is, down to the clay, on what grounds do you suppose that this concrete would be broken away?—My belief is, that if the scour of the river does remove the gravel, then this mass of concrete will break up. I cannot imagine that if the gravel which partially supports this concrete were scoured away, you would find the concrete in the same form. The question to my mind is, whether it is prudent so to build the piers of a new bridge as to require such a deposit of concrete for their safety.

295. But you are aware that in all the bridges which have been built in London there has been a protection put round them; that even in the case of the stone piers of Waterloo Bridge, the engineer deposited concrete round those piers as a precaution, and in the same light I provide for this concrete being put round the pier?—I can understand one engineer putting concrete round his pier, and another carrying his pier so deep as not to require concrete. I argue thus: that if I had to be responsible for building a bridge in the Thames I should carry the stone shaft of the pier so deep into the clay that none of those adjuncts should be desired, and that the bridge should be perfectly safe and secure without them; and for the reason which I have stated, because

because I know that after a thing has stood for a certain number of years there will be a forgetfulness of all those precautions; those precautions will be overlooked, and of course the structure will suffer from their being neglected. But the Committee will, of course, understand that one engineer may be excessively over-cautious, and another engineer may be, I should say, not so cautious. I should make the pier self-supporting; I should make it dependent upon its own strength both in foundation and in structure.

296. On what basis do you consider these foundations to rest; are they not upon the London clay?—I think not.

297. What is it that will resist the weight of the bridge when the bridge is finished?—The weight will be carried, according to my apprehension, by all those iron piles and the wooden piles which support the pier; therefore you may say that the clay is ultimately to sustain the weight; but it has to sustain that weight without that uniform distribution which I think is a very important element in the strength of such works.

298. With respect to the distribution of the weight, do you not consider that a granite plinth 2 feet 6 inches thick would be a sufficient distribution of the weight?—I think not. If that were so, there would be very little object in the concrete being put between the piles; because the weight of the pier carried by the plinth is transmitted directly to the piles through the separate or detached stone blocks placed upon their heads.

299. What are those blocks?—Stone blocks, two feet square. If I could be quite certain that I could make this concrete, which is put round the piles, and is brought up to the level of the plinth course, as unyielding as those piles, then I should say that was a firm foundation. But seeing that the concrete rests upon the gravel, and that it is not even carried down to the clay, I doubt very much whether you can calculate upon the weight on the plinth course being carried by the concrete. I think that you must go back again and look for the strength of your pier to the piles.

300. Then, supposing the weight is carried by the piles, you are aware that the weight upon these piles is 14 tons upon every pile, and that at London Bridge, it is 80 tons upon a pile. Now, taking 14 tons to be the weight upon the pile, and knowing that many temporary piles carry perhaps double that weight, should you apprehend any danger to the pier from such a weight being laid upon the piles?—I have been trying, but apparently without success, to explain the difference that I draw between a foundation having piles cut off level with the solid clay bed, with a very strong grating laid over the whole surface. There you have an assimilated strength. The weight of the pier is thrown over the whole area of the foundation. One pile cannot sink without another, and consequently I should say, that in London Bridge, it is not a question of how much weight is carried by each pile, but it is a question of how much weight per foot the whole area of the foundation has to carry. Here, on the contrary, from the peculiarity of the construction, I must again express my opinion (it is a matter of opinion) that the weight has to be carried by the piles only.

301. In building a bridge, if you found in a river a series of rocks, would you not found your piers upon those rocks; you would not seek for any other foundation?—Clearly not.

302. Do you consider that it makes any difference whether the weight comes at this point or at that point, provided the pile is sufficient to bear it?—I would say take this case. I adopt the old mode of foundation. I find the clay insufficiently strong to carry the weight which I have to put upon it; I therefore drive a quantity of piles into the area of the foundation for the purpose of consolidating the ground, and so not only making the piles part of the foundation, but by condensing the ground into which they are driven, increase the strength of the whole. Then, with a strong grating of timber I secure a uniform foundation, the weight to be carried being also uniformly distributed.

303. Supposing all this cut away and the space filled with concrete, would you have any hesitation about the stability of the pier?—I mentioned to you, when discussing the subject, that if I had been called upon to adopt a mode of founding a pier, such as you have adopted, I should not have brought my piles up; I should have cut them off down to the level of the clay, and I should have considered iron casing as merely a means of enabling me to remove all foreign matters in the bed of the river down to the clay. If I had determined upon such a foundation as that, I should have put in a mass of concrete, so as

J. M. Rendel, Esq., and *J. Simpson*, Esq.

11 July 1856.

to have filled up the entire space between the iron casing to the level at low water. I said, and I still say, that would have been, in my judgment, a much more stable foundation than bringing up the piles to above low water. But I wish the Committee clearly to understand that this is a matter of opinion upon which two professional men may very fairly differ.

304. Supposing this mass of concrete to be filled in on clay, would you have the slightest doubt as to the stability of the foundation?—I should not like it, for this reason: I should say, at once, that to be perfectly satisfied about my concrete I must put it in with a coffer-dam; and if I were driven to use a coffer-dam, then most unquestionably I should not use concrete; I should build it with stone. The Committee will see that I am in a little difficulty in discussing this matter with Mr. Page. I give this only as my opinion; and I quite admit that Mr. Page has as much right to exercise his opinion, as I have mine, and is just as likely to be right.

305. Would you consider the pressure of 15 tons on each pile, or between two and three tons on the clay, at all calculated to affect the stability of the structure?—My answer to that is, that I should not leave it to a question of opinion. If I had to be responsible for that plan, I should load that pier, before I talked of its being safe, with four times the greatest weight that could be brought upon it in the finished structure.

306. What objection is there to loading Pier No. 4, under the direction of an engineer?—None. I should say it would be for your own comfort that it should be done; I should unquestionably load it; I think that if you did not do so you would be in a degree of uncertainty that would not be consistent with due care.

307. With regard to the deepening of the river, you stated that you believed the river will fall to a considerably lower level, and that it will approximate to the level of the sea water; are you not aware that it is found in several cases, that the low water in the Thames, opposite the London Docks, is lower than the low water at Sheerness?—Yes; that you find in many other tidal rivers; because we know that the oscillation of the tidal wave is such that it will fall just as much lower than its mean level as it rises above it, unless there is some obstruction. But what I meant was this, you have now the sea low water in the Thames. I believe that the gravel upon the whole of this part of the bed of the Thames will be washed out; and I am perfectly sure it will be so, if ever the Thames Embankment be carried out.

308. Mr. *Tite*.] I gather that your opinion is, that you think, that if the piles were cut off, and solid stone work brought up, it would be better?—I think it would be better; but my impression is, that you should carry the footings of the bridge down at least seven feet below the surface of the clay; that you should obtain a large area by footings, and that you should not drive piles into the clay, except upon careful boring you found that there was some defective ground which required to be consolidated.

309. (By Mr. *Page*.) Supposing you had gravel there as hard as concrete, would you not found upon that?—Certainly not, with the iron casing; I would not interpose a third description of ground in my foundation. Again, there is the difficulty of being quite sure that all your iron piles are sound, and that all the joints are so close as to confine the fine gravel under the concrete.

310. *Chairman*.] If I rightly understand you, in your judgment, even if such a plan of construction as this were desirable to be adopted, you would wish to put it in with a coffer-dam, so that you might see altogether the nature of the ground, and make sure that your concrete got upon solid ground?—Yes; I think the nature of the construction demands that every part of the work should be seen by the workmen; Mr. Page, I am sure, will agree with me, that nothing is so important to the stability of his work, as that all those piles should be close, and that all the iron ties should be secure beyond all question; now there is the greatest difficulty in driving those piles with the requisite degree of nicety; and there is also a very considerable amount of difficulty in getting divers to do iron work such as the fastings of these ties securely; therefore, even supposing these structural arrangements to be the best that could be adopted for the purpose, I would rather have them executed in a dam, particularly that part of the work which will have to be built upon the sites of the present piers; I think it would be essential there.

311. (By Mr. *Page*.) With respect to coffer-dams, will you be kind enough to explain to the Committee how those dams would be arranged with reference

to

to blocking up the river, because the plan I am carrying out has special reference to keeping the tideway clear, and with reference also to time, which of course is important?—Undoubtedly it would take more time; but when an engineer is asked to be professionally responsible for the safety of a structure of such importance as Westminster Bridge, he is bound to give a plan that provides for stability before time or cost. My own opinion is, that whether it takes a year more or less, or whether it costs 20,000 *l.* more or less, those are matters of very little importance compared with having a permanent bridge. All our experience upon the Thames of late has been such as to show that if you wish to have a permanent bridge, you must look at the foundations with especial care.

312. Would you say that the practice of engineers on the Continent has been to set aside all the mechanical improvements in making the foundations, and to go back to the old coffer-dams?—If I thought that any particular course was necessary for the particular site I had to deal with to render my bridge permanent, I should use my own judgment in preference to the experience of other people, whether on the Continent or in this country. I do not know an profession that can be less stereotyped than engineering.

313. In your report on the Lara Bridge, at the Institution of Civil Engineers, did you not say that in consequence of the shifting nature of the bed of the river, you adopted a caisson instead of a coffer-dam?—I did not say that I adopted a caisson instead of a coffer-dam because of the shifting nature of the bed of the river. What I said was, that because of the extreme looseness of the sand which constituted the bed of the river no dams could be formed, the foundation would have blown up.

314. The bed of the river was washed away?—No doubt.

315. What was the artificial bed that you put outside the foundations of the bridge in order to preserve the river in a suitable state?—The course I adopted was this: Having founded the piers and abutments as deeply as we could, we allowed the scour of the tide to deepen the channel between the piers according to its own will. In many places the sand had been scoured out eight or ten feet below the original bed of the river. And then the plan I adopted was this: in the limestone quarries close by, I had very strong tenacious clay; I threw that clay over the whole washed part of the bed of the river, to within about five feet of the original level. After the clay had been softened, I threw upon it a layer of stone, which made a sort of clay concrete, and that answered remarkably well; but we did not fill it up again quite to the level of the original bed.

316. Would not that plan answer here?—If you could be allowed to make a weir across the river.

317. I will take 12 feet at low water, and suppose that we have dredged to that, and I ask if you have an apprehension of the effect of the scour of the river, whether the same precautions that you adopted at the Lara Bridge could not be relied upon if carried into execution here?—You might secure it; but as a practical question I do not think it would be worth while to build a bridge across the Thames that would require such precautions. I should build this bridge in such a manner as to prevent the possibility of such precautions being necessary. But in giving these answers I do not mean to say that I am right or not; it is quite open to Mr. Page to think differently. Every professional man, when a question of this sort arises, is bound to exercise the best judgment upon it, which his experience enables him to form; but that would be my plan, and being asked these questions I am bound to say so.

318. Colonel *Boldero*.] I think the difference of opinion between Mr. Page and yourself is confined to the mode of constructing the piers; the superstructure of the bridge you approve of?—Yes, except that as a question of construction, there are parts of the superstructure that are new to me, and I should not myself mix cast and wrought iron together in the same ribs; but that is a much more simple difference of opinion.

319. Did I rightly understand you to say that, in your opinion, it is necessary that all bridges should be built by the system of coffer-dams?—Not at all.

320. With regard to concrete, may not concrete be successfully used in many cases?—Certainly; the whole question is, where and how the concrete is applied; I am using concretes to a great extent now.

Martis, 15° *die Julii*, 1856.

MEMBERS PRESENT.

Mr. Henley.	Mr. Tite.
Sir Benjamin Hall.	Sir John Shelley.
Colonel Boldero.	Sir W. H. Jolliffe.
Mr. Jackson.	

THE RIGHT HON. JOSEPH WARNER HENLEY, IN THE CHAIR.

Robert Stephenson, Esq., a Member of The House, Examined.

R. Stephenson, Esq., M. P.

15 July 1856.

Mr. *Stephenson*.—I feel, Mr. Chairman, before proceeding to answer any questions the Committee may wish to ask me, that it is necessary to state that I have never, either professionally or otherwise, examined in detail the plans of the New Westminster Bridge now in progress; I fear, therefore, that I shall only be able to give very general answers to any questions that may be put to me.

Chairman.—The Committee only wish to put such questions to you as have reference solely to the general principles of bridge construction.

321. *Chairman*.] WILL you have the goodness to state to the Committee your views upon the subject before them?—I may begin by at once stating that as far as the stability of the pier goes, or its capability of withstanding any pressure that may hereafter come upon it by the superstructure, I can have no hesitation in saying that there need be no apprehension upon that point. The mere question is as to the permanency of the structure in itself, and the arrangements which have been proposed by Mr. Page for protecting the pier from the scour hereafter in the river. I may say at once that the application by Mr. Page of cast-iron piles, as a shell to the pier, is quite novel, and I think, to some extent, objectionable, for a structure of this character. Mr. Page seems to have felt, I think, to some extent, that a cast-iron shell to a pier was objectionable, on account of boats running against it. There is no cast-iron shell which one can put there, round a mass of concrete or piling, which would not be cracked immediately on a bump from any barge floating in the Thames; it would be broken. With a view of meeting the difficulty, Mr. Page has stopped the cast-iron piling at six feet below low water, evidently with a view, as he told me yesterday, of protecting it against that contingency. I may say that it is not a contingency, but that it is, in fact, a certainty, because I have had accidents of that kind, and I have known of several where the momentum of a vessel would crack any cast-iron shell like a lobster shell; there is nothing which can resist a blow of that kind. Accidents have taken place in the river; at the Victoria Docks, within the last fortnight or three weeks, a vessel went against some cast-iron piling, and it was all broken to pieces as if it had been an egg-shell. Therefore, Mr. Page, after adopting cast-iron piling, has properly, I think, stopped it within six feet of low water. I will state, before I leave the cast-iron piling, that it is a novelty, as far as its application to a work of great permanency is concerned. Bridges over the Thames are meant to last, not for 50 years, or 100 years, but for 400 or 500 years. Engineers have been in the habit of applying cast-iron to wharfing, for making a wharf on the river side. Now, knowing that cast-iron is liable to decay, whenever immersed in water, or exposed alternately to wet and dry, it might be said to be objectionable in the application which I have mentioned to wharfs; but that is not so. Engineers apply it there because they feel that to make coffer-dams upon a large scale for the purpose of getting masonry into a greater depth and of making it extremely permanent, would incur an expense which would be inordinate to the object in view. Therefore cast iron as wharfing may be regarded as an expedient employed for the purpose of bringing property into play. It is done at a much less cost than masonry; it is done in much less time; but it is always done with the knowledge that it must be repaired, perhaps in 20 years or in 30 years. Now I think

I think that cast-iron piling in this case is objectionable, because this work is evidently meant to be a very permanent work. We know also (for the experiments have been very extensively made) the decay of cast iron when exposed to moisture. Mr. Mallett, of Dublin, laid before the British Association some years ago a most elaborate series of experiments on the decay of cast iron, both in salt water and in brackish water. Those experiments lead inevitably to the conclusion that in moist situations, and more especially where there is any brackish water, cast iron is subject to decay. That being the case, I am afraid that I can hardly agree with Mr. Page that a cast-iron surface is a desirable one, although removed from blows from the navigation. There is another peculiarity here; Mr. Page has placed upon the cast-iron piles a shell of granite slabs, 18 inches thick, I think; and he fills up the whole area of the pier with piles and concrete. Upon that, when brought above low water, he builds his granite pier. It is a rule now amongst engineers, that whenever any great weight is to be superimposed upon a building, that building should be made as uniform in its character as possible; that it should resist equally throughout the whole area the pressure upon it. Now here there is timber, there are piles, there is concrete, and there is granite on the outside; they may be made to approximate very nearly perhaps in strength, but the difficulty in my mind is in making them all bear equally; if they do not all bear equally, subsidence may take place in one part and not in another. We see that in all cases, even in a common house, you always see that the thin walls subside and the thick ones do not; there is always a drawing away; I allude to the partition walls of the house. I think however that that would not be at all a serious objection. I feel, being called upon by you to give a professional opinion, that I must explain fully my views; but I do not imply that the pier would not be able to bear any superstructure which might come upon it. On considering the question, if this structure of Mr. Page's were removed away from the old bridge, I should not have much hesitation in saying that it would be a permanent structure, at least one of considerable durability, notwithstanding the objections which I have raised.

322. If I understand the construction, there are timber piles in the interior surrounded by cast-iron piles, with sheet-iron casing on the outside, topped with granite filled up with concrete?—Yes.

323. According to the plan, it is proposed to put granite capping upon the top of each of those timber piles, and granite casing, and upon that to lay a platform of granite, to sustain the bridge, is it not?—Yes.

324. In that case the whole weight of the bridge would be thrown upon the timber and iron piles, those timber piles being supported by the concrete filled in between?—It is so.

325. Have you any experience, or is there any mode of ascertaining, what the probable duration of timber would be in such a situation, in the midst of concrete high above the water?—If you will excuse me, these is no timber high above the water here; the piles are all driven down to the level of low-water mark, and therefore you have to consider the timber as constantly immersed.

326. The timber will always be immersed?—It will; it is only shown here a foot, I think, but that need not be done. The piles are intended to be driven down below low-water mark; therefore, as far as the durability of the timber is concerned, I think you may consider that as everlasting; because we know, from the piles taken from London Bridge, or any old structure through the country where they have been constantly exposed to moisture, that the durability of timber is illimitable.

327. So far as that portion of the structure is concerned you would consider that it might be regarded as permanent?—Quite so.

328. Then, coming to the outside casing of the iron piles, you do not think that cast iron, exposed to the action of the water, can be considered as permanent?—Not so permanent as I think it ought to be in a structure of this kind.

329. Not so permanent, for instance, as a pier of granite masonry?—Certainly not.

330. In the event, in the process of hundreds of years for which they may be in the bridge, of one accident happening to any of these iron piles, what would be the facility or otherwise of replacing the structure?—It would be very difficult; in fact you could not replace it without a coffer-dam.

 331. Would

R. Stephenson, Esq., M. P.

15 July 1856.

331. Would it be more or less difficult than replacing masonry, if masonry were decayed?—I think just the same.

332. Neither more nor less?—No.

333. In that respect then there would be no superiority or inferiority one way or the other?—Not as regards the replacing, supposing both to decay.

334. But your evidence is to the effect that you think that cast iron is not so permanent as granite?—Certainly not.

335. Mr. *Tite.*] You seem to entertain no doubt whatever, that a pier constructed as this is, is perfectly equal to any weight of perpendicular pressure that will probably come upon it?—Quite.

336. And you are of opinion that no apprehension with regard to it need be entertained?—No; I may state that the high-level bridge at Newcastle, over the Tyne, is about 120 feet high; it is built upon about from 30 to 40 feet of quicksand; I adopted this plan, in fact, without the cast iron. I had a coffer-dam first, and then drove the piles just as these are driven, inside the coffer-dam; I drove them below low water, I think it was 10 feet; I am not quite sure about that; I have written down to the north to get the plans up. The piles were driven down considerably below low water in this quicksand, they varying from 40 to 50 feet in length; that might be said to be as unstable a foundation as can be well conceived. There the coffer-dams, of course, were left in, nothing was drawn out; the mere sand was pushed out of the way, and timber put in. I think the pressure upon that is 12 tons to the foot; and Mr. Page informed me yesterday that this would not be much more than two tons to the foot.

337. It must be vastly more?—I made an experiment at Newcastle with piles of this length; and driven under these circumstances I have no doubt that they would sustain 100 tons.

338. You spoke of the system of iron casing being novel: I think that you or Mr. Bidder constructed the great Brunswick Wharf?—That was done by Mr. Walker. I constructed a much larger one at Fleetwood; there I used cast iron.

339. Do you recollect whether, in the Brunswick Wharf, or in your case, the lower casing of iron was piling side by side, and not piling with plates?—I do not remember that.

340. My impression is that the Brunswick Wharf has a row of iron piles abutting each upon the other?—Yes, I believe the lower tier is so.

341. Is that so at Fleetwood?—No, we drove the plates down between the piles.

342. As in this case?—Just as Mr. Page has done here.

343. At Fleetwood is it permanently under water at low water?—Yes; I have not seen it for some years; there may be some silting up, but it was intended to go below low water.

344. And it was actually so?—Yes.

345. Do you think that booms could be applied in the present case?—I think that a bridge ought not to require booms.

346. In driving these piles and plates six feet below low water, do you apprehend that any great accuracy or certainty could be ascertained as to the lower plate reaching a solid bed or bottom in the clay?—I do not apprehend much difficulty, practically, in that; I think it would show itself in the driving, whether it really reached a good foundation or not.

347. The plate?—Yes.

348. Of course the pile would find its bottom?—Yes; I think it might be ascertained by divers.

349. To see what hindered it from going down?—Yes, and probably to remove it. I think that is a practical difficulty which might be met if it did arise.

350. With respect to the oxidization of cast iron in water where there is no salt, you have adverted to the very well-known fact that the oxidization of cast iron in salt water goes on rapidly, and that it becomes something like plumbago; do you find that any change of that kind to any extent goes on in cast iron in water not salt?—I believe in all water; there is no water which has not what is chemically a salt in it.

351. Salts of lime?—Salts of lime, magnesia, and others, especially in a river of this kind, where a large quantity of extraneous matter is thrown into it;

it; it may be regarded as a fluid holding salts in chemical solution; therefore I have no doubt that even in fresh water oxidization and decay will go on in time.

352. Mischievously?—Yes; in mines you often find it with cast iron, even where the water does not contain much salt, where changes of temperature are going on. I had in one of my own mines to re-case a shaft with cast iron which had become in the space of 12 or 14 years very soft.

353. It might contain sulphuric acid, might it not?—There was no sulphuric acid in that case; I particularly directed my attention to that.

354. One word with regard to unequal pressure; you explained the uneqal pressure, that is to say, that outside the iron there is the granite, but that inside there is first the clay between the piles, then the gravel upon the piles, then the concrete, and then there are the heads of the piles with the stones upon them; do you think that practically that would lead to any inconvenience, the pressure being entirely unequal; do you think that practically any ill consequences would result from that combination?—With a pressure of two tons to the foot, which Mr. Page says is the maximum here, I do not know that I should apprehend much danger even from this unequal texture in the structure; but it is an objectionable mixture. If, for instance, the high level bridge at Newcastle had been put upon such a foundation, I am quite sure it would have subsided unequally; this structure may be quite equal to two tons to the foot, or three tons, but it might be very unequal to 12 tons.

355. Is it usual to trust a structure where you at all approach the limit?—No.

356. What test would you think the right one?—There is no test which you can put to it in a temporary way, because time works such changes in the subsidence of structures of this kind; I have seen them stand for 12 months or two years and then show symptoms of failure afterwards, not dangerous failure, but a mere fracture in a pier.

357. You are aware that the pile is one foot in fact above the low water; do you understand that to be the lowest low water?—Yes; Mr. Page distinctly told me so.

358. Still there is a foot?—Yes; I suggested yesterday that it ought to be cut off below low water; it ought not to be allowed under any circumstances to get dry.

359. And a foot would be objectionable in your mind if a foot were left?—Yes, it would; Mr. Page met that yesterday very fairly; he said "It is very easy to cut them off." We cut ours off at Newcastle considerably below low water, I think about five feet.

360. Sir *W. H. Jolliffe.*] I understood you, in your answer to a question from the Chairman, to say that these piles were to be driven to low-water mark?—Yes.

361. And that you contemplated that the low-water mark in the river Thames at Westminster Bridge may vary hereafter, in consequence of the removal of the impediments to the tide now existing in the river?—I understand that some latitude has been taken by Mr. Page; that he even goes below the low water at present, and that he assumes that there will be a lower low water than the present one; how much he has assumed I do not know. I will guard myself against being misunderstood here. Whatever may be contemplated as the lowest low water hereafter, the piles ought to be driven down to that point: that is quite clear. Therefore if any improvement took place in the river Thames by which the low water at Westminster Bridge should be lowered four or five feet, then I think any timber above that point would be objectionable; it would be subject to decay. I have often seen timber, as far as I could judge, with concrete around it, which appeared, under those circumstances, to accelerate the decay rather than otherwise.

362. Therefore if you were now called upon to make a recommendation with regard to the depth to which these piles should be driven, you would recommend them to be driven four or five feet lower than Mr. Page has designed?—Yes; always assuming that this is the lowest low-water mark which has yet been experienced.

363. As it is proposed, and as you would recommend it, the granite course of the superstructure should commence at the lowest low-water mark?—Certainly.

R. Stephenson, Esq., M.P.

15 July 1856.

364. You will observe that in Mr. Page's plan, which is before you, there is a very considerable depth of gravel above the clay laid down; that there is a bed of clay through which the piling is driven, and that then is a straight line of gravel; supposing Mr. Page put the piles in as he proposes, without coffer-dams, could he ascertain that that would be the state of the different strata through which the piles would pass?—It is about 9 feet 7 inches of gravel lying upon the clay.

365. Would not the driving of the piles through the gravel into the clay have the effect of sqeezing up the clay through the gravel?—Very little; it would not at all damage it in an engineering point of view certainly.

366. Would you recommend that the concrete should be placed on the top of the gravel rather than that the gravel should be removed, and that the concrete should go down to the clay?—I have no hesitation about the Thames gravel; I have built very heavy structures, merely keeping the gravel in.

367. Therefore you have no doubt as to the foundation being sufficiently secure, supposing it to remain in the state in which it was put in?—Not the least.

368. With regard to the cast-iron casing, you think that it would be liable to decay?—I think so; I am speaking of a long time.

369. Looking to the size of the plates and the piles, can you state what period might elapse before they would decay?—No, I cannot state any period, because the elaborate experiments, which I have already mentioned, made by Mr. Mallett, of Dublin, on the decay of cast iron in brackish water, seemed to depend very much upon the uniformity of texture in the piling itself. In ordinary casting there were some hard places and some soft places in the piles, or in any casting, and being galvanic, the rapid action seemed to depend upon the contrast between the texture of one portion of the casting, and the texture of the other portion. If, therefore, you could conceive a casting of perfect uniformity, the action would be very slow; but, on the other hand, if it were irregular in its texture, then the action would be very rapid; it is so in brackish water, certainly; it gets into holes. It was very well shown in many experiments which were made by Mr. Mallett; the most valuable experiments which I know on cast iron, are those by him.

370. Do you consider that the iron ties would be subject to the same action of decay as the casing?—In this case I think they would be almost free from that action.

371. You think that it would not have the same effect upon the inside as it would upon the outside?—I do not think it would be altogether exempt; the water might get in there upon the gravel bed, and oxidization might take place.

372. I think you stated, in answer to one of the questions put to you, that the usual desire of architects in erecting substantial buildings was, to assimilate the weight and durability of the material as much as possible throughout?—Certainly.

373. Is that the case in this design?—No; I am bound to say that that does not appear to have formed an important feature in Mr. Page's consideration. He might know that the pressure was not more than two or three tons to the foot, and that he was not bound to consider the necessity of that uniformity.

374. That object not being carried out in the proposed structure, would it be liable to more vibration, constructed as it is at present, than would otherwise be the case?—No; as an abstract question I do not pretend to answer it; but, practically speaking, there would be no vibration which would at all be of consequence.

375. Or which would be injurious to the iron ties?—No.

376. Sir *John Shelley*.] I understood you to say that you did not think that by driving these piles into the clay, the clay would be forced up in any way?—I did not say so exactly, but that it would not be forced up injuriously.

377. A former witness has said this: "My experience tells me that piling in London clay does not always improve it. The London clay is so exceedingly compact and solid where it is sound, that you find that for every cubic foot of timber you drive in you displace a foot of clay." Do you agree with that?—It must be so.

378. Must not the clay come up through the gravel, supposing the gravel to be there?—It does not follow that it goes up; it may very easily go sideways.

ways. If you drive a foot of timber into the clay, it must displace a foot of clay, and that must go somewhere; in all foundations that remark applies.

379. You do not think that there is anything particular in the nature of the London clay different from any other with regard to the effect that any admission of moisture into it has?—It is peculiar; but as regards that particular circumstance, I do not think that it materially differs from any other clay.

380. You do not think that the fact of piles being driven upon the London clay, and thereby exposing moisture to go into it, would have such an effect upon the clay as to loosen the piles?—Not seriously. London Bridge was built upon piles driven in that way, and Waterloo Bridge in the same way.

381. Colonel *Boldero.*] If embankments and piers were erected on the river the same as at Chelsea, would not they produce a freer run of the water?—Undoubtedly.

382. Would not the scouring property be thereby increased?—I think it would very much.

383. Do you not think that in the course of a few years, the whole of the three feet of gravel now lying above the clay would be swept away?—There are nine feet of gravel; it is a question, but I do not think so.

384. Still it would have a great effect in scouring the river?—No doubt.

385. What is the nature of the tide at Newcastle, where you put your bridge over the Tyne?—It is the same as in the Thames, excepting that it is not quite so high. The Thames has 18 feet at London Bridge, and I think the tide at Newcastle Bridge is about 12 feet; not quite so much perhaps.

386. You of course have seen the borings of this bridge?—Yes, I have seen them.

387. You did not take them yourself?—No, not officially; I heard them spoken of.

388. It is clay all the way through, is it?—After you have reached the London clay, there is no change for some hundred feet.

389. It is not clay all down the river?—No; there is another formation at the Thames Tunnel, which was the cause of that coming in; that formation does not exist here.

390. Mr. *Jackson.*] Have you ever considered whether cylinders would be better than piling for the foundation?—I should not adopt them in this situation. I have employed cylinders extensively; for instance, in Egypt for two bridges over the Nile, where the silt was excessively fine, and no foundation could be got. I sank cylinders seven feet, six or eight feet in diameter, to a depth of 40 or 50 feet; then we filled within those piers the concrete or masonry. I am quite prepared to admit that hereafter the cylinders themselves will decay; I shall not live to see it; then the bridge will still have masonry to stand upon after the cylinders have gone; therefore the cylinders in that case are merely employed as a temporary expedient to get down to a deep foundation. I do not apply the iron there in the hope of its being there 200 years hence.

391. By means of a cylinder you can see the character of the strata better than by means of piling; you can ascertain what you are really building upon?—Yes; but in this case, where you get to a watertight bottom, a clay bottom, a coffer-dam is the thing; the cylinders are only used where you cannot get any foundation at all except at a great depth; when you use a cylinder there is one huge pile instead of a great number of piles; but then you use a cylinder where you cannot drive piles properly. I could not have driven piles into the Delta of the Nile; at least, I should not have known where they would have gone to.

392. Mr. *Tite.*] You spoke of the Victoria Docks; is there not a stratum of gravel there which is intensely hard on the top, with running sand underneath it?—There is.

393. Are you sure that in this case, practically, the gravel between the rows of piles is as compact as any concrete put in upon it?—I believe quite as compact; in some foundations, instead of concrete I have washed the gravel and put it in without any lime at all; it is as strong as concrete itself; of course it allows the filtration of water, and therefore is undesirable; but in places where the foundations are constantly exposed to moisture wet gravel is just as good as concrete.

394. Can you oblige the Committee with the height of the granite slab?—It is eight feet.

R. Stephenson, Esq., M.P.

15 July 1856.

395. Is it tied in, or proposed to be tied across with an iron tie?—It is.

396. That would be wrought iron of course?—Yes.

397. Would or would not that be exposed to a good deal of oxidization?—That was just the question which Sir William put to me.

398. It is wrought iron that we are speaking of now, not cast iron?—Just so; it would be laid in concrete, and I do not think that the concrete would be pervious to water.

399. Is the head shown to come through at all?—Yes.

400. And it would be exposed to the action of the air and water?—Yes, that portion would; but I should not think that a serious objection; they could repair that very well.

401. *Chairman.*] Having answered the questions which have been put to you with regard to the construction of the pier, I think I gather upon the whole that you consider it amply sufficient to bear the weight, but that you doubt its durability for a very long period?—Precisely so.

402. Will you state your opinion to the Committee whether the difficulty of this construction is increased or otherwise by the fact of its having to be put in at twice; that is to say, half of the pier having to be put in at one time, and when that is completed, the bridge upon it to be opened for traffic, and then the old bridge to be removed and the new piers to be placed where the old bridge has been removed from?—I have considered that subject a good deal. I should not, perhaps, have felt that there was any great difficulty in it, if we had had no experience beforehand regarding the foundations of the old bridge, but with the knowledge of the difficulties which have arisen in that bridge, I do certainly feel that it must be a precarious operation. The old foundations put in by Labelye were what are called caissons of masonry sunk down, the bottom being dredged out and made as level as possible, and a wooden box with a portion of masonry in it being sunk down to the bottom to find its level as well as it could. That in time, of course, has failed; the timber has decayed, I suppose, to some extent; at all events, changes have taken place which rendered the reparation of the bridge necessary a few years ago. The repairs were undertaken by Mr. Walker. He put coffer-dams in, and endeavoured to underpin the old foundations which had given way. He had apparently done that very successfully with a certain number of piers, but before they get many done, the new work which they put in began to subside, showing clearly that the foundation was exceedingly insecure. What the precise state of the foundations under the old bridge may be, is a question that nobody can decide; it is quite clear that they are very unsound. How far it will be necessary to remove those foundations, or to what depth, is also uncertain, when you come to add the other half to this bridge, supposing this first half to be completed. I do not deny that it may be done, but I must say that I should only undertake it from sheer necessity. I think that very likely the expense of expedients may be necessary. I think it is not improbable that coffer-dams may be necessary. If there had been no bridge there, and it had been all sound clay, then I think that Mr. Page would have successfully carried the thing out, but with the knowledge of those facts which I have just explained, for it is perfectly notorious that the foundations of the old bridge are in a very precarious state, would, if you meddle with them, you do not know precisely the extent to which the difficulty may go, and you may be driven to have a coffer-dam.

403. If I understand your statement aright it is this, that you think that if this had been altogether upon fresh and new ground the plan suggested, and which is being carried out by Mr. Page, might have been sufficient, and that the foundation might have been sound enough to put the bridge upon, with the exception of the question of its durability, which you have stated?—Certainly.

404. But it being complicated with the foundations of the old bridge, which is known to stand upon very doubtful and insecure foundations, you think that the security of this mode of foundation will be made more doubtful, and the difficulties proportionately increased?—That is quite my opinion.

405. That being your opinion, may I ask you further, knowing that there has been a very large expenditure already incurred upon this bridge, would it be your opinion that it would be wiser economy for the nation, who have to carry out this plan of building a bridge at Westminster, to sacrifice the money which

which has been already expended, and go to the expense of building solid piers deep in the London clay; or would it be wiser, such an expenditure having been already undergone, to carry out the existing plan?—That is a very large question, and I should hardly like to give an off-hand opinion. I never turned my attention to the subject until I had the pleasure of receiving a note from you the other day. I have never been near the works, and I had not the pleasure of knowing Mr. Page even, before yesterday.

406. That as you say is a large question, though it is the practical deduction to be made from the evidence which we are taking; would you wish to have further time to consider that question after you have seen the works?—I should, before I offered an opinion upon that point. I should be very happy to come before the Committee on another occasion, after I have formed my opinion; that is a serious question, involving professional reputation as well as money.

407. Going from the construction of the piers to the state of the bed of the river, you are aware that the bed of the river, owing to London Bridge having been pulled down, and other causes, has undergone, and is undergoing at this time, very great change?—Yes; and I believe that the changes which are going on, and the extent to which they may go, can hardly be ascertained now, but that they will be very considerable if ever the Thames is quayed, as I suppose it will be, or ought to be, for it will never be in a healthy state until that is done; then I should not be surprised to see the scour go on to a very great depth here.

408. If the scour should go on to a very great depth, and the rapidity of the tide should be increased, and the flow of tidal water should be very much increased or altered, all these would be reasons for additional care and precaution in founding a structure of this importance, would they not?—Obviously.

409. Speaking of the scour, I observe in the plans, which no doubt you have noticed, that there is a proposal of dredging out the gravel and surrounding the piers by a deposit of concrete as shown in the plans?—Yes, I have observed that.

410. In your judgment, is such an operation as that in a river exposed to the flow of water, likely to be a permanent security?—It would be, if what is called the *régime* of the river remained the same; I think it would be an adequate provision; it is a very similar provision to what Mr. Rendel, I think, made in the bridge which he built in the south, the Lara bridge; he protected the bottom of the river from scour by stone and by clay; that has remained for many years, and I think it is likely to remain for many years longer. If we look forward, as I said before, to a very marked improvement taking place in the Thames, I think this would require rectification from time to time; I do not think that the probable additional scour would endanger this structure; I think at all events that if there was any danger it would be easily met by putting in concrete.

411. With reference to the action of the water, would ice be a likely thing in severe winters to damage the cast-iron casing?—It would be a very serious thing indeed if the cast-iron were brought up to low-water mark, but here it is kept at six feet below low water; therefore I do not apprehend that the ice would ever be able to strike the cast iron so as to occasion anything like injury.

412. Your judgment would be, that in this river the ice is never more than six feet deep, which is the depth of the iron below the water?—Yes; I had occasion to consider that question most seriously in the case of the bridge over the St. Lawrence at Montreal; there the ice piles up to from 30 to 40 feet in height; then of course anything like cast iron exposed to the shock would go like matchwork.

413. Do you find that there the ice is not very deep below the water?—It piles up one piece upon the other to the bottom of the river.

414. In a severe frost here, would there be anything like ice six feet below low water?—I think not.

415. Sir *W. H. Jolliffe.*] I think you said that you contemplated that a very great improvement would take place upon the Thames by quays being built; in fact that the Thames embankment would be carried out?—I think so.

416. Therefore it is your opinion that any permanent bridge which is built over the river Thames, should be built upon such a plan as would contemplate such an improvement?—I think so; I am not at all prepared to say that that

R. Stephenson, Esq., M.P.

15 July 1856.

improvement would destroy this bridge, but with those impressions upon my mind I think that I should have laid the foundations deeper and more permanent; I am obliged to say that.

417. You would have carried a masonry foundation down to the clay?—I do not know whether I should have taken it down to the clay; probably I should; I think very likely I should have taken the coffer-dam itself, and taken the masonry down to the clay.

418. Viewing the proposed construction and the increased difficulties of carrying it out, which you contemplate from the removal of the old bridge, if it had fortuitously happened that the Board of Works had submitted this plan to you, would you have been able to assent at once to their embarking in this construction?—No, I should not have adopted the plan. Whilst I admit that the plan may be perfectly sufficient, it is not the system which I should have adopted, if I had been called upon to design the bridge myself. I never saw the design before, but I have heard of it. You will observe that there is a continuous series of cast-iron arches, and they are fitted together accurately; they may be taken to be almost absolutely one mass. I suppose the width of the river is from 1,200 to 1,300 feet there. Now I have never myself known anything like a continuous series of iron work of that length which would not by expansion or contraction be fractured in many parts of it; it could not be kept in an easy state. For instance, in the Britannia Bridge provision is made for the tubes to roll and extend out as they do daily, to the extent sometimes of two inches, and 2½ inches in summer. I believe the extreme variation is four inches; that is on about 1,200 feet; very much the same length as this. In the high level bridge at Newcastle, which is a continuous series of arches, also of the same kind as this, provision is made to allow the arch to be as easy as possible. I do not know what provision has been made in this design; but if none be made, I think it could; some alterations, I think, would be necessary, because I am quite sure that that series of arches would injure each other. If you attempt to tie in a mass of cast iron tightly between abutments something must give way.

419. In all the cast-iron superstructures of great extent with which you are acquainted, provision has been made for expansion and contraction, and you do not find that in this plan sufficient provision in that respect has been made?—I will take the Southwark Bridge, which is a case in point; that is an exceedingly easy structure; it rises and falls every day. Serious apprehensions were entertained at one time, when it was first opened, of its being permanently injured, but it is so enormously strong, that it has resisted that effect. You will, however, see on the footpaths, when passing over Southwark Bridge, that the pavement is all distorted by the expansion and contraction of the iron. The Sunderland Bridge also is wedged in between two abutments of masonry, or rather rock, and there the bridge has fractured itself all to pieces; it is in a precarious state at this moment; I am going down in a fortnight or three weeks to look at it. I did examine it five or six years ago; there was no provision made then for the expansion and contraction, and it is now in a precarious state. No cast-iron structure of any length can be permanently safe unless you make provision for expansion.

420. And you believe, from what you have seen of this plan, that it would be liable to all the disadvantages which have attended the cast-iron structure of Southwark Bridge, and the bridge at Sunderland, which you have mentioned?—I think it would be, unless provision has been made for it; I mentioned that to Mr. Page yesterday; and he said provision had been made in the longitudinal girders, but not in the arches; I think that a little modification, probably, in the present design would meet that objection; still there is no provision made for it at present in the arches.

421. Do you think that those modifications could be easily made?—I think so; but they are absolutely necessary.

422. The modifications which you contemplate with regard to this superstructure of iron, and which you think would be sufficient to meet the difficulty on that account, would not be of a very expensive character?—No, I think not.

423. Sir *John Shelley*.] With reference to the question of building the bridge at twice, did I correctly understand you to say, that from the experience which has been gained since the work began, you are of opinion that there would

would be great difficulties in doing it now?—The experience was obtained when the first attempt was made to repair the old bridge.

424. Not since the beginning of this work?—No; it was in consequence of the failure of the attempts to repair the bridge that this became necessary.

425. So that the opinion which you have to-day given, with reference to the building at twice, is not affected by anything which has been done at the present works?—No.

426. Mr. *Tite.*] Can you at all explain the causes of the failure of the works which Mr. James Walker did for underpinning the foundations of the old bridge; we have had it in evidence that the dams were singularly sound, so that they were kept dry with hand-pumps; can you at all explain the cause of the failure of that underpinning, which might have been put in apparently under very advantageous circumstances?—I have some views on the point, but they are not sufficiently well founded, I think, or based upon an examination sufficiently extensive, to enable me to give them with great confidence. I can, however, suggest what my view is at once. The underpinning of the pier, of course, had to be done by driving piles outside the old pier, and they had to get the masonry, as it were, underneath the old masonry. The masonry was supported on piles, no doubt, or whatever it might be, on a soft foundation; but then, with respect to the interior of the piers, although the under-setting might be sound for one or two feet within the surface of the old pier, and including the additional masonry that they put in, there was a want of uniformity in the texture of the whole pier, because the inside was not underpinned and the outside was. Therefore it might be compared, in a rough way, to having granite supports, as it were, underneath a shell, and not equally substantial supports in the interior. The bridge, therefore, subsided, as it were in the middle of the pier.

427. Still historically, doubtless you know (I have Labelye's own language under my hand), that before the old bridge was finished and opened, he gives the following description: "In the months of May and June 1747, the western 15-foot pier of Westminster Bridge was perceived to settle very gently at first, but so much faster towards the end of July 1747, that it was thought absolutely necessary to take off the ballustrades, paving, and part of the ballast that laid over the said pier, and the two arches adjoining. By the continuation of the settling of this pier, those arches lost their regular semicircular figure; considerable openings in the joints showed those arches in some danger, and some of their stones, both in the fronts and their sopheits, were split and broken: one of them actually fell out of the least arch in the river, and another was taken out to prevent its falling down."—I think the end of it was that it sank so much that he loaded it; it still sank, and they put in the centres, and the two arches at that end were re-turned?—Yes.

428. Do you know to what cause Labelye attributed that failure?—I do not remember at the present moment.

429. It is not stated in this book, but he did state distinctly that it arose from inequality in the stratum; that there was no want of care in the dredging, but that when they laid the pier upon it, there was some inequality in the stratum which he had not ascertained, and that this pier sank in consequence?—Yes, I remember the circumstance; I do not know to what he attributed it, but very likely it might be so. The surface upon which the caisson was sunk may have been hard clay and hard gravel, without his knowing it; in that case it would subside unequally.

430. Historically, there is no more known, I suppose, upon that point?—I am not aware of any further information.

431. With regard to the expansion and contraction of Southwark Bridge, that is met by the arch rising?—It does rise.

432. The arch is pinned in between the stone piers, and the arch rises?—Yes; it rises partially, to meet a portion of the expansion, and the material itself is compressed to a certain extent; the two together are called into action every day.

433. However you think that without any very expensive arrangement, in fact by some scientific arrangement, the expansion and contraction to which this bridge would be subjected, which is not now provided for, might be provided for?—I think so.

 434. Your

R. Stephenson, Esq., M. P.

15 July 1856.

434. Your experience is that it must be provided for, and that it could be met in this case, although apparently at present it is neglected?—It is absolutely necessary, I think.

435. If that were done, might the arching and the framing be usefully and permanently used; do you see any objection to it?—I have not sufficiently examined that part of the structure. I have not seen detailed drawings of it. If I can have the detailed drawings submitted to me I shall be glad to give my opinion.

436. It is suggested as one objection, that it is somewhat unusual to have the metal in two states, namely, cast and wrought iron; I do not at all know what that means myself; that would be a question of construction, I apprehend, not of principle?—I do not think the mixture of the two objectionable; but they might be mixed in a way which might be objectionable. I do not know how they are mixed here; only from hearsay, at all events.

437. Mr. *Jackson.*] That is a difficulty which could be got over?—I cannot give any opinion about it just now. I have not seen the drawing of the arch.

438. Sir *John Shelley.*] Were you aware that the original intention with respect to the piles was to screw them into the clay, according to that drawing?—I saw them there shown this morning.

439. Do you consider that that would be an advisable course, and better than driving, or not?—Both are used, and it depends upon circumstances. If it is possible to screw them in I would have them screwed, but I do not see any objection one way or the other.

440. Do you think that the screwed piles would be stronger or better than the driven ones?—No, I think not.

441. The alteration from screwing to driving would make no difference?—I think that as circumstances are shown here screwing would be better.

442. *Chairman.*] Assuming this plan of pier to be persevered in, in your judgment would it be better to make one continuous pier throughout at each arch to carry the two bridges, if I may use such a phrase, or would it be better to put in a separate pier for each half of the bridge, and merely to let the roadway of the bridge be connected after the two bridges are completed?—It would be better to put in the whole width of the pier at once.

443. But as that cannot be done here, as it must be done at twice, in your judgment would it be better to have two separate piers, or one continuous pier, that one pier being put in at twice?—I would keep them quite separate; the separation would not be visible to the eye; they ought to be quite separate. The old pier, the first portion of the thing, would have got all its pressure upon it, and it would have assumed its normal condition; then as to the other one, if there was any attempt to tie it into the old portion before it had got its weight on it, there must be a rupture between the two.

444. Then the intention with which these piers are carried out, being, if I may use such a phrase, to have a species of cast iron and granite box to contain the concrete and the timber piling, in your judgment it would be better to have two cast-iron boxes distinct, and not connected with each other?—I would make provision in that case, because it would be difficult to have two separate cast-iron boxes, as you could not carry it through the pier; I would make provision at the junction to allow the one to subside without affecting the other; it could be easily done.

445. That is not shown at all upon this plan?—No; but it would not be a serious difficulty.

446. Mr. *Tite.*] In point of fact, you would not bond them?—No; I would let them slide one past the other.

447. Colonel *Boldero.*] In working under water in a river like the Thames, are you not liable to meet with difficulties which it is impossible for any engineer to contemplate?—Undoubtedly, in all rivers.

448. Would not a coffer-dam have been better to conquer those difficulties than the present mode of building the bridge?—Yes; I have no hesitation in saying that I should have adopted that plan.

The Right Hon. Sir *Benjamin Hall*, Bart., a Member of the Committee; Examined.

Right Hon. Sir *B. Hall*, Bart., M.P.

15 July 1856.

449. *Chairman.*] IN consequence of the failure of the contractor, who was carrying out the works at Westminster Bridge, your attention was specially called to the whole subject?—Yes. I will state to the Committee that I was appointed to the Office of Works in the month of July last; and I commenced my duties about the 24th or the 25th of July. Soon after that (I think it was in the month of August, or very early in September), Mr. Mare called upon me, he being the contractor for Westminster Bridge, and asked me to make him some further advances beyond those which he was entitled to under the contract. I told him that I did not think that I could do so, and that he might call again on a day which I named, which was about two days afterwards. I then adhered to my determination not in any way to alter the contract with regard to advances of public money to the contractor, and there the matter rested. Mr. Mare became a bankrupt on the 25th of September; and in the month of December communications were made to me by the assignees of Mr. Mare, requesting that I would consider proposals for taking the works off their hands. I declined the offer which was made to me, being desirous that the contract should be fully carried out by them, and should be adhered to in every way. I went home for the Christmas holidays on the 22d of December, and I returned from Llanover on the 5th of January. On Monday, the 7th of January, a gentleman, in whose experience I have great confidence, called upon me in Stanhope-street; he thought that I should direct my attention very particularly to the state of Westminster Bridge, which he described to me as not being in a very satisfactory condition; and he intimated that it would be better for me to call in some professional aid that I might be advised and guided as to the course which I should pursue, as head of the department having charge of the works. That was on the morning of the 7th of January. I went down to my office, and after considering the subject I determined upon consulting Mr. Rendel. I spoke to Mr. Austin, the Secretary of the Board, as I do upon all subjects; and after consultation with him I wrote this letter to Mr. Rendel: "Office of Works, &c., January 7th, 1856. Sir Benjamin Hall presents his compliments to Mr. Rendel, and would be very glad if Mr. Rendel would call at the Office of Works to-morrow, at half-past two, as Sir Benjamin Hall wishes to consult him on a matter of some importance. If Mr. Rendel cannot come at half-past two to-morrow, perhaps he may be able to do so at the same hour on Saturday." Mr. Rendel called upon me, and I told him that a communication had been made to me by a gentleman, who was interested in my proceedings, and that I was very anxious to have his advice in relation to the state of Westminster Bridge. I entered as fully as I could into the subject with him; and I said, "I think that this is a matter of very great importance; the plan of the bridge has, to a very great extent, been approved by a Parliamentary Committee; it was carried on by my predecessor, Sir William Molesworth, under that sanction, and therefore in a matter of this magnitude it may be advisable for you not to incur yourself the whole responsibility in relation to the advice which you may give to me, but that you should have some other gentleman associated with you in the task which I am desirous of imposing upon you." I ultimately suggested to him that Mr. Simpson would be a proper person to be associated with him in this matter. I told him that I was not aware that I had ever seen Mr. Simpson; that I had never consequently had any communication with him upon the subject; and I wished to get the advice of two gentlemen who were wholly unconnected, as regarded this matter, with the department over which I presided, so as to have the most unbiassed opinion that I could get from the most eminent professional men. He approved of the course which I suggested, and immediately after he left me I wrote this letter to Mr. Simpson: "Office of Works, &c., January 8th, 1856. Sir,—I am anxious to avail myself of your assistance in relation to some works now going on under this department, and I shall be obliged by your informing me whether you could, in conjunction with Mr. Rendel, examine those works and report your opinion to me. Should you be able to do so, I should wish you to inform me accordingly, and in that case I must request you to see Mr. Rendel, and to

Right Hon. Sir *B. Hall*, Bart., M. P.

15 July 1856.

make arrangements with that gentleman to call at this office any day next week between one and three, excepting Monday and Saturday, when I will enter into the subject with you both, and give you such instructions as may be necessary for the prosecution of your undertaking." Mr. Simpson and Mr. Rendel called upon me subsequently to that; and in order to show the Committee that not a single day was lost in action on my part, I, on the 16th day of January directed a letter to be written to Mr. Page, which has been put in before the Committee, and is to this effect: "Office of Works, 16th January 1856. Sir,—I am directed by the Chief Commissioner of Her Majesty's Works, &c., to inform you that he has considered it advisable to have the works of Westminster Bridge examined by some eminent engineers. He has, therefore, directed Mr. Rendel and Mr. Simpson to visit the structure, and to report to him fully upon all points in relation to the contract, the nature of the works, and all matters relating thereto, and to advances and future proceedings. I have, therefore, to request that you will put yourself in communication with those gentlemen, and afford them all the information and assistance you can in the prosecution of their inquiry." That letter was addressed to Mr. Page on the 16th of January; therefore, it will appear to the Committee that the information was given to me on the 7th of January; that I saw Mr. Rendel on the 8th, and that I saw Mr. Simpson, I think, about the 12th or 14th of January. I saw them both at that time, and within 48 hours after that interview a letter was addressed to Mr. Page, the engineer of the works, requesting him to put himself into communication with those gentlemen, in order that the whole matter might be inquired into. That will bring the Committee down to the evidence which is already before them. From that time to the present I have taken no step in the matter whatever without the advice and the sanction and direction of those two engineers.

Veneris, 18° *die Julii*, 1856.

MEMBERS PRESENT.

Mr. Henley.	Mr. Ker Seymer.
Sir Benjamin Hall.	Mr. Tite.
Mr. Bramston.	Sir John Shelley.
Colonel Boldero.	Sir W. H. Jolliffe.
Mr. Jackson.	

THE RIGHT HON. JOSEPH WARNER HENLEY, IN THE CHAIR.

John Hawkshaw, Esq., and *John Fowler*, Esq., called in; and Examined.

J. *Hawkshaw*, Esq. and J. *Fowler*, Esq.

18 July 1856.

450. *Chairman.*] (To Mr. *Hawkshaw.*) YOU are a Civil Engineer?—I am.

451. You are aware of the nature of the proposed construction of the piers at Westminster Bridge?—I am.

452. Have you examined the drawings according to which those piers are proposed to be constructed?—Yes, I have examined the drawings, and also the work, as far as it was practicable to examine it in its present state.

453. The work shows you what has been done, the drawings show the mode in which it has been proposed to do it?—Just so.

454. The work is constructed of piers driven into the ground, filled in with concrete, and surrounded by cast-iron piles and cast-iron casing and granite casing?—Yes.

455. What is your opinion of that mode of construction?—As regards its strength and its capacity to carry the structure which is intended to be placed upon it, my opinion is that it is quite sufficient.

456. You think that it is sufficient to carry the structure proposed to be put upon it?—Yes.

457. Considering

457. Considering it sufficient to bear the structure to be put upon it, what is your opinion of the probable durability of such a structure?—I have no doubt about its being a structure of very considerable durability. As regards the internal works of the pier, I look upon them, speaking of those things as practical men are in the habit of speaking of them, as being pretty nearly indestructible. With regard to the cast-iron casing, we have not had the same amount of experience as to its durability in situations of that kind which we have had of other materials; and no doubt any opinion which I expressed upon that point must be expressed with more caution, because we are not aware of any cases where cast iron has been used in former times in that mode for the purpose of sustaining structures of this nature. But I have taken some pains to inform myself on that point, and I have no doubt at all that a structure so built will endure for a long period of time. Of course, I could not say that a facing of cast iron will endure as long as granite. The only extensive series of experiments which have been made in reference to the durability of cast iron that I am acquainted with were made by Mr. Mallett of Dublin, who was asked by the British Association to make experiments upon the durability of cast iron and of other irons also, and to report from time to time to the British Association. These experiments were made with great care, and they continued for some years. I have referred to his third report, which was made to the British Association at its meeting at Cork in 1843, and I have made some extracts from that report which I hold in my hand. Assuming the corrosion which he found from a very large series of carefully conducted experiments, I find that supposing we can depend upon them, the cast-iron plates and the cast-iron piles which are proposed to be used at the Westminster Bridge, would endure for a very long time. Perhaps I can explain this best by referring to those experiments, and giving the Committee a general idea of their bearing upon the question. Mr. Mallett exposed various irons; the experiments which I refer to are those which are applicable to cast iron in different kinds of water. He immersed the irons in what he calls clear fresh river water, and the result of that experiment I will state: the samples of iron were Scotch cast iron, Welsh cast iron, Staffordshire cast iron, and Irish cast iron; these were exposed in the waters of the Liffey for 732 days sunk in a box, that was about two years; the result of that appears to be as follows. The mean corrosion per square inch of surface is one grain; including the decimals, 1·011 grain. Now the weight of a cubic inch of iron is 1,700 grains, and this was the amount of corrosion in two years. The result of that would be, that supposing only one surface of cast-iron plate were exposed, it would take 3,362 years totally to corrode a plate an inch thick, but if both surfaces were exposed, it would take 1,681 years to eat through a plate an inch thick, assuming that experiment as the basis.

458. That calculation would assume that the corrosion was to go on at an equal rate, neither faster nor slower, during the whole period?—Just so. I am going through these experiments because I believe they are almost the only experimental data which we have, which have been ascertained with great care; I thought perhaps the Committee would like to have them before them. No doubt these will require modification afterwards.

459. Without going through the whole list, are you prepared to tell us the result, in your mind, having examined those calculations, as to the probable durability of cast-iron such as is employed or proposed to be employed in the construction of these piers?—If you will permit me I will refer shortly to the three other cases.

460. You may put in those calculations, but I think it is impossible for us to follow decimals and matters of that kind, and we wish to have the result of your information, you having considered these things; tell us the result of your observation and opinion?—Having stated one, I should like to state the other experiments, because that one gives a very long term, and there the iron was exposed in very clear water. I am not going through them in detail; I will give the results shortly. The next experiments were in foul river water.

461. Sir *W. H. Jolliffe.*] Do you imagine that that water would be of the same description as the water of the Thames?—I should think so; it was in the Liffey, opposite the junction of the Poodle river, on a bottom of putrid mud. The result which Mr. Mallett arrived at was (dealing with it in the same way), that if one surface was exposed it would take 1,200 years to

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

eat through the iron; if both surfaces were exposed, 600 years. The next case is where he immersed cast iron in sea water in Kingstown harbour. There he gets 530 years for one surface, and 265 years for both surfaces. The time is shortened when you come to deal with salt water, therefore I think it is rather an important experiment. The next case is where he immerses cast iron in what he calls foul sea water; it was close to the mouth of the Great Kingstown main sewer, with a bottom of soft putrid mud, the iron being immersed in the same way. The result of that is, that it would take 506 years to eat through an iron plate one inch thick, acting upon one surface, and 253 years to eat through it, acting on both surfaces.

462. *Chairman.*] Having gone through that paper, will you tell the Committee what your opinion is as to the probable duration of the plates and cast-iron piles proposed to be used in this work?—I should liken the situation of this bridge perhaps to that of foul river water; I think that would be a fair view to take of it. I think that it should be also considered that the water may act upon both surfaces, because it might get into the gravel and get to the back of the plates. I take it that the plate would be strong enough if diminished one-third of its thickness, or even one-half.

463. In how many years would that diminution of one-third take place?—If we are to take the foul river water experiment as a basis, it would occupy 200 years.

464. Then by any irregularity of action or any irregularity in the quality of the iron, or any error in these calculations, it might be less than 200 years, or it might be more?—Yes, there is no doubt it might be less from causes to which you have alluded, and it might perhaps be more, because those were ordinary specimens of cast iron, not cast under the same pressure which Mr. Page has had these castings cast under. I think it may be assumed that the castings used at Westminster Bridge are of excellent quality. But on the other hand, they are liable to irregularities of action, and also to be affected by matters finding their way into the stream of the Thames which one cannot foresee. I should, as far as it is possible to judge in the present state of our information, expect them to last for a very considerable period of time.

465. You have stated that in your judgment the interior composition of the piers is of an indestructible nature?—Practically I think it may be so considered.

466. If anything, either by lapse of time or external injury, were to happen to the external iron casing, the security of the internal structure would be affected very materially, would it not?—No doubt; if that part of the iron casing which protects the gravel from the action of the water were to be destroyed, then the gravel would wash out, unless it were again protected in a similar manner.

467. You have used the word "considerable," with reference to the time that iron might probably endure in such a position, what distinction do you draw between that and "permanent;" should you consider, for instance, that 200 years would be a fair limit to a permanent structure?—That is a matter which depends upon so many conditions that it is not a question easy to answer; it must be answered with limitations. I think that a bridge, the endurance of which could be reckoned at 150 years, might be considered a permanent structure; it is a long period of time to look forward to, and supposing we assume that in 150 years, or even in 100 years, the plates which surround those piers were so far corroded that it became evident that they were too weak for the purposes for which they were intended, it would not be a difficult matter to surround them by fresh plates.

468. As a professional man engaged to carry a great work over a large river for the purpose of securing important communications, do you consider that that work would be satisfactory to which you could only look forward for 50 or 100 years without its undergoing repair?—Certainly, 50 years I should not consider satisfactory; I should think it too short a term to reckon upon for a structure across the Thames. But, on the other hand, I do not see why bridges across the Thames should be viewed differently from the way in which you would view structures for railways. It is a question in my mind whether it is not more important to have two or three bridges across the Thames, that the public may be accommodated, and to have those bridges quickly, though in 100 years' time you may have to make considerable repairs to those bridges; and

and I should incline to say that it would be better to do that than to spend the money which those bridges would cost in erecting only one bridge which would last 500 years. These are matters of opinion, which will be looked at very differently by different minds, but I do not see that you should look to a bridge which is to carry cabs, omnibuses, and foot passengers with very different eyes from those with which you look upon a bridge which is to carry railway trains at 50 miles an hour.

469. If I understand you, the result of your evidence is, that you consider that a pier so constructed would be less durable than granite?—Certainly.

470. And that you consider that it may endure for a considerable time; but that if anything happens, either from lapse of time, or from injury to the iron casing, the external structure will be to an extent endangered, and that you consider it better on the whole to have a bridge of a less expensive character, although less permanent, than one that is more substantial and erected at a greater expense?—Yes. Of course it will depend in a measure upon the difference of cost; but I should say that if it were to be laid down as a rule that all bridges across the Thames should only be built with coffer-dams, with granite piers.

471. I am not asking that question; be so good as to answer my question?—I was trying to explain myself. I was intending to answer it. It is very difficult to say "Yes" or "No" to questions of this sort, without being misunderstood. I do not know whether I fully understood your question, but I was going to say that, supposing it is to be laid down as a rule (because I fancy that this inquiry might lead to that in the minds of the parties who are conducting it) that the bridges across the Thames are so important that they ought to be constructed by means of coffer-dams and granite piers taken deep down into the clay, then every engineer will admit that the cost of all bridges across the Thames will be very greatly increased, and therefore the practicability of building bridges across the Thames, and the number of them, must be very much diminished, and consequently we should have fewer means of passing from one side of the Thames to the other.

472. I think you have stated that you consider a pier of this kind amply sufficient to bear the weight of the structure proposed to be put upon it?—Amply sufficient. The weight is comparatively trifling to those weights which have been imposed by engineers on other structures.

473. Have you taken into consideration the scour of the river, and the changes which its bed has undergone and is undergoing?—I have.

474. Do you consider that that has any bearing, and, if any, what bearing upon the question of the security of piers of this construction?—It has a bearing upon the question, but I think that so long as you may assume the cast iron to endure, a bridge built as this is proposed to be built would be fairly guarded against any reasonable scour which appears to me practicable in the Thames. No doubt it would be possible to permit the construction of such works in the Thames as would cut away the foundations from any bridge. There can be no limit to scour if works are permitted which would cause that scour. But referring to the past history of the Thames, I think that the old London Bridge and the scour caused by the removal of that bridge is an exceptional case, which is never likely to happen again to the same extent. The old London Bridge was really a dam or a weir across the river. It prevented the tide coming up, and prevented the water flowing away, and the removal of that bridge caused a very great change in the bed of the Thames. But I cannot conceive of anything occurring which could produce an effect equal to that produced by the removal of the old London Bridge; at all events, I think it would be the duty of the conservators of the river to disallow any such works as could produce anything like an effect equal to that.

475. In your judgment, assuming that a structure such as is being carried out here was to be carried out, is it better that it should be carried out with or without coffer-dams?—That would depend upon conditions. I as an engineer (and I fancy almost every other engineer would do the same), if I were asked to build a bridge, and told that expense was not an object, would probably avail myself of coffer-dams, because the use of a coffer-dam is to isolate a portion of the bed of the river, and to turn it into dry land, and the engineer builds there as he would build upon shore, and it removes a great deal of anxiety, and makes the matter easy. But if the money is at all limited, then I consider that the

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

mode adopted in building Westminster Bridge is one that may be adopted with safety; it requires care, no doubt, and caution.

476. In carrying out such a plan as is proposed in this case, do you consider that such work as is to be completed under water may be sufficiently seen by means of divers, so as to ascertain that it is properly and securely done; or, in your judgment, would it have been more wise to have done it by means of coffer-dams?—I have no doubt about the practicability of doing the work well in the manner in which it has been done, and I state with confidence, from what I have seen of that work, that it has been done exceedingly well.

477. Had you been responsible for it, you would have endeavoured to have carried it on without coffer-dams in the mode in which it is now carried on?—I should not have had the slightest hesitation in so doing, provided the condition of the question was that I was to expend only a certain sum of money.

478. Putting expense for the moment out of the question, would you upon your responsibility have carried it out with or without coffer-dams?—If I wanted to build a granite stone bridge——

479. I am not asking of a granite bridge, but of this bridge; if you had had to carry out this bridge upon your professional responsibility, would you have carried it out, putting these piers into the river with or without a coffer-dam, to enable you to see the ground, and the mode in which the work was done?—I can scarcely answer that question, unless I understand what money I am to expend.

480. Without reference to expense?—Supposing expense were no question, if I were to have my choice, I should prefer a coffer-dam, because it would be much easier for myself, and less trouble.

481. Still, preferring that, you have stated your opinion to be that the work may be sufficiently examined by means of divers to see that it is complete and perfect in its mode of putting in?—Quite so. I have not the slightest doubt about the character of the work being fully equal to what it will have to do.

482. It is intended to carry this bridge out at twice, that is to say, half the new bridge is to be built first, then the old bridge to be removed, and the other half built by the side of it; do you apprehend any additional difficulty, or any difficulty, in putting the piers in at twice, or any insecurity as arising from that circumstance?—I do not apprehend any difficulty in putting the piers in at twice, nor do I think that any insecurity will arise from that circumstance. I may state that I have seen it suggested, or heard that it was suggested, that the bridge should be built in two separate parts.

483. It is to be built so, is it not?—What I mean is, that they should be absolutely separate; that one should be able to settle independently of the other. I do not think that necessary, nor would I so build it if I were erecting this bridge.

484. Do you apprehend any difficulty in taking out the foundations of the old bridge from the uncertainty of the state in which the ground may then be found, and in completing the piers which may then have to be put in upon the spot where the old piers were taken from?—I apprehend no difficulty from it; I think it may be done so as to make that part of the work as secure as the other.

485. You think that that may be easily done without coffer-dams?—Decidedly.

486. In your judgment as an engineer, should you prefer building two separate bridges, side by side, and connecting the roadway, or having one connected structure as is proposed on this occasion?—I should certainly prefer having it one connected structure; and if I thought the difficulties of the work were such as to require that the two halves of the bridge should be separate and independent of each other, I should say, do not construct a bridge in that manner at all. But I believe, that the bridge may be constructed on the plan which is proposed, and when constructed, the pier will become one whole pier, and there will be no unequal settling which will have any practical effect upon the bridge.

487. Will you state to the Committee what, in the present state of affairs, would be your recommendation to be done?—That would almost require more consideration than I have had time to give to the question; I may state generally, that I see no cause myself, from my views of what such a structure should be, for not proceeding with it. There are small matters of detail which probably

probably I should alter, and I dare say that every other engineer who might be consulted would alter them differently; but I believe the bridge may be completed in the manner in which it is commenced, so as to make a durable structure within certain limits; and looking to the question of time, and to the question of expense, and to the importance of removing the unsightly structure which at present stands in the river, I should proceed with the bridge rather than begin upon another plan, which would involve its removal, or involve that which would lead to very slow progress, namely, the use of coffer-dams.

488. (To Mr. *Fowler*.) Have you examined the plans of Westminster Bridge?—I have.

489. You have heard the evidence which Mr. Hawkshaw has given; do you concur generally in the statements which he has made?—Yes, I do generally; I think I should go, perhaps, a little further than Mr. Hawkshaw with regard to the permanence of the bridge by the present plan, so far as it is affected by the iron casing; before the iron casing was affected I consider that the bed of the river would have taken a permanent form, and therefore there would be no scouring to be apprehended that would affect the foundations, which are guarded at present by the iron casing; I believe that by the time the iron casing gave way it might be dispensed with altogether.

490. You think that the iron would probably be so permanent that the riv then would have taken its permanent shape, and after that if the iron were alt gether removed there would be no danger to the structure of the pier?—That is my opinion; that the stability of the bridge would not be affected at that period of time by the iron casing in any way whatever.

491. That pier is partly cased in iron and partly in granite?—It is.

492. And, in your judgment, if the iron in that time were altogether decayed, the internal structure of concrete and piles would be sufficient of itself?—Yes; in my opinion it would be a permanent bridge; and by the time the iron casing decayed, it might be dispensed with altogether.

493. In that respect you are of opinion that it would be more permanent than Mr. Hawkshaw has expressed?—Yes, to that extent; I think that all apprehension of change in the bed of the river would by that time be entirely done away with.

494. In your judgment, should you be of opinion that such a structure would be as permanent, or more or less permanent, than a granite pier?—The comparison would carry one to such an extended period of time, that I should say as an engineer, practically it would be as permanent, although it is possible that a solid granite bridge would last a longer time than this bridge; but for all practical purposes, the period of time would be so extended, that I should call it a permanent bridge in the most extended sense of the term.

495. What in your judgment is the interpretation of the word "practical" with regard to time; what number of years do you assign to it?—I think when you get over 150 years, that it is not a matter of consequence how much a bridge of this kind extends beyond that period, before some little attention may be given to it; I should put 150 years as the minimum which I should give to this bridge, before it really required any attention whatever.

496. Upon your professional reputation, would it be sufficient if you thought that a work would stand for 150 years?—No, that is not quite what I mean. This bridge might be made to last several times 150 years, provided something should occur to require attention, and provided that attention was paid to it. For instance, supposing some interference with the bed of the river took place by the erection of some improper works, I quite agree with Mr. Hawkshaw that any works which would materially interfere with the bed of the river, so as to cause a scour there, would be improper works. Supposing all these improper things to take place, and the stability of the bridge to be affected by them, it would be quite possible to provide against the consequences of such a state of things. Therefore in my opinion the permanent character of the bridge would not be altered by the possibility of its requiring in an indefinite period of time some further work, especially when I bear in mind that that is an improbability founded upon an impropriety.

497. The bed of the river has been mainly affected, I suppose, by the removal of London Bridge?—Yes. At the present time the low level of the water at Westminster Bridge is so nearly similar to the low level of the sea, that there is only 10½ inches difference; so that we may fairly presume that the causes

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

which the removal of London Bridge has kept in operation for a great many years, must now very nearly, if not altogether, have ceased.

498. Would the embankment of the Thames, if it should take place, have any effect upon the scour of the river in that particular part?—No, I think not. I think the effect of embanking the Thames would be to make the bed of the river more equal, but not to cause an irregular scour.

499. In your judgment, it would not affect the bed of the river at this particular point?—No, I think not.

500. Is there any other point in Mr. Hawkshaw's evidence which you would either wish to modify or to express yourself as agreeing to?—There is one point with regard to the weight of Westminster Bridge, upon the different classes of material, to which reference has been made. I think that although theoretically that is an objection, yet practically it is not. I mean this: that the weakest of those materials which would have to sustain the weight of the bridge is more than sufficient to sustain it, and therefore the difference in the classes, or the difference in the resisting power of those classes, does not come into operation, and consequently is perfectly immaterial. I think that you might dispense with the piles altogether, and that the concrete would be sufficient; I think that you might dispense with the concrete, and that the piles would be sufficient; and therefore the difference of material in this particular case is perfectly immaterial, because the weakest is sufficient.

501. Then are the Committee to understand it as your opinion, that, assuming that no timber piles had been put in in the centres of the piers, and that this iron casing had been filled in with concrete, and that in process of time the iron had disappeared, the concrete would have been sufficient of itself?—Yes; at the same time I should not recommend it, because I would have the additional security which has been provided in this case.

502. I am not asking whether you would have recommended it, but whether in your judgment it would have been sufficient?—I have no doubt of its sufficiency to carry the bridge. This bridge is a very light bridge; it is not more than one-third the weight of either the present Westminster Bridge or London Bridge, or a good many others; not more than will be found upon the foundations of an ordinary large house.

503. The iron being removed by the process of time, you think the concrete would be sufficient to stand the wash of the water by itself?—Yes; but I coupled that answer with my opinion, that long before the iron was affected, the bed of the river would have taken its permanent form, and that therefore you would not have to apprehend any scour.

504. Assuming that you should be incorrect in that particular, and that from whatever cause, the bed of the river did deepen, what then would be your opinion?—Then it must be protected, no doubt; that would be a very simple operation.

505. That is a casualty which might or might not happen?—It is an exceedingly improbable thing, and would occur at such an indefinite period of time, that I think one might go on speculating for ever in that way. For instance, in the case of a bridge which you choose to found 50 feet into the London clay, you may assume that the scour of the river may be affected, and that that bridge may be brought down. You must stop somewhere.

506. You would consider it so improbable, that if you had had to maintain your professional reputation, you would have ventured upon it?—Certainly. I have no hesitation in saying so.

507. Is there any other point in Mr. Hawkshaw's evidence upon which you wish to observe?—I do not know whether Mr. Hawkshaw mentioned the difference in the sectional area at the different bridges; it is a point which I have inquired into, and I have ascertained that the sectional area at Westminster New Bridge will be considerably greater than exists now at London Bridge, or Southwark Bridge, or Blackfriars Bridge, and of course very considerably more than exists at present at Westminster Bridge. The sectional area is the space through which the water flows, omitting all the obstructions in the form of piers and arches; the clear watercourse.

508. Of course that you consider as an element introducing the chance of less injury to the piers?—Yes, and making the extent of scour more improbable, because you would have the sectional area so great that the tendency would be to deposit and not to scour. My opinion is, certainly, that when

Westminster

Westminster Bridge is completed, the sectional area will be so much increased that the tendency will not be to scour at that point.

509. The less the interruption to the course of the river, the less chance there is of disturbance?—Certainly.

510. Is there any other point of the evidence, or of the subject, upon which you would wish to offer any opinion to the Committee, confining yourself to the foundations of the bridge?—I think not, except to confirm Mr. Hawkshaw in his opinion of the exceedingly superior character of the work done. The concrete is quite equal to any concrete I ever saw; and whatever care the peculiar design required in the construction and in the selection of materials, has been abundantly carried out in the execution.

511. The work has been well done, as far as you could see it?—Yes, it has been done in a very superior manner.

512. Mr. *Tite.*] (To Mr. *Hawkshaw*). Have you seen the specification of this bridge, so as to compare its executed form with the conditions originally attached?—I have not.

513. Are you aware whether the water of the Liffey is brackish at all?—I only take it from what Mr. Mallett says, he says, "Clear fresh river water in the Liffey above the tidal influence," therefore it would not be brackish.

514. Are you at all aware that it has been determined by recent analysis, that there is a very considerable amount of sea salt at high tides, even as high as Battersea?—Yes; I should not give this as a fair representation of the Thames; I think I stated that I considered what was called foul river water a better definition.

515. My question is not as to foul river water; my question is, inasmuch as those experiments show that the action of the salt water is very much more rapid than that of foul river water, whether the fact of a quantity of sea salt being contained in the water of the Thames under certain circumstances might not increase the rapidity of the destruction of the iron?—No doubt; and I think you will find that my opinion as to the probable durability (it is a very difficult point to give an opinion upon) is modified by the experiments in pure sea water. Assume that there would be as much corrosion in the Thames as there is in clear sea water. Clear sea water gives 265 years, if the plate be exposed on both sides. It is safer to assume that, than to assume fresh water.

516. With regard to these plates, how thick are they, in point of fact; is there a rib at the back?—Yes, they are exceedingly strong; there are two or three ribs at the back, and they are a full inch thick.

517. The main substance of the plate is an inch thick, with a rib at the back?—Two ribs.

518. Are there any round the edge?—Under the upper flange there are one or two brackets besides. The piles, which are 15 inches in diameter, are also an inch thick.

519. Have you read the evidence which was given on Tuesday?—Yes, I saw Mr. Stephenson's evidence.

520. It has been suggested that danger might follow from fracture from a violent blow to these plates?—There is no necessity for that, because the plates will not be exposed to a blow; there is no difficulty by keeping the piles a foot or 18 inches shorter, in having a permanent band of granite round the piers at that point, which would always receive the blow of barges at low water, and would protect the piles; it is quite easy, and would not affect Mr. Page's plan in any important degree; the plates could not be struck

521. That is hereafter; but does it apply at all to the present piers as they are constructed?—It could even be applied to the present piers.

522. So as to put the iron plate below the probable influence of a blow at low water?—The plates are at present below the influence of a blow; the only thing now exposed to a blow is the top of the pile. It is a small detail, but I should certainly prefer keeping the piles a little shorter, and having a broad face of granite, so that any barge would strike that, and not strike the pile. There is another advantage, that it would keep the bearing piles more under low water, which would be better.

523. Will you be good enough to explain to the Committee the mode in which you suppose or know that the two halves of the bridge are to be united; I understand you to say that in your opinion it is desirable to bond them, and that of course they will be bonded; how is that butt-end which is left, and to

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

which some attachment is to be made hereafter, cut off at present; the other half must have timber, and concrete and gravel, and a variety of matters which you must bring together again; how is that proposed to be managed; I understand that there is no iron casing where it is left off?—That end must be stopped up with something, or the concrete would run into the water; there will be sheet piles necessarily across the end.

524. That is at the finished half which is to be used by the public when complete, with the pitching and the paving?—Yes.

525. That of course involves very considerable weight on what I understand to be the flush or butt-end; is that your opinion?—Yes; but the weight is trifling; I am persuaded if you were to put the weight of two of those arches, or three of those arches on one of those piers, it would not affect it; it is a matter not difficult to try; put the granite upon it, and instead of weighting it with two tons per foot, which is said to be the load, put four, five, or six tons per foot upon it.

526. What length of the first half would be executed; because I do not suppose you mean that the rib should rest exactly on the finished line?—No; this shows the length of the part proposed to be put up at first (*producing a drawing*).

527. What is the total length of the pier without the cutwaters?—It appears to be 85 feet without the cutwaters.

528. How much of that 85 feet is built in the first instance?—It appears to be about 40 feet according to this scale. I am now giving it without the cutwater. You may call it about 45 feet, if this plan is correct.

529. Some few feet beyond the half?—Yes, that is the projection; the square end of the pier, the unfinished end, will extend a few feet beyond the half of the bridge.

530. It is built in halves, and the additional length which is given is, in point of fact, the abutment of that end?—Yes.

531. Do you think that the driving of these large piles and the great violence which is applied to them to drive them would shake the concrete or gravel out underneath, or would have that tendency?—Not at all; I do not apprehend any difficulty of that kind. It must be borne in mind in dealing with the old bridge that the old bridge is upon caissons, which are resting upon the gravel; they do not go deep. The mode adopted of building the old bridge was only like building masonry in a coal barge, and sinking that coal barge to the bottom. I think any one who will examine the plans of the old bridge will not be afraid of the difficulty of removing it.

532. The bed of the river is not there much encumbered?—No; when the old caisson is removed all that you will have there will be gravel, which has been compressed to the extent that the weight of the old bridge would compress it. I do not believe there is any difficulty in extending these piers, and in removing the old bridge without coffer-dams. I should not feel any great difficulty in doing it.

533. Do the new piers coincide in all cases with the old ones?—No; there is only one pier which does coincide with the old; there is another which laps over the old about half its thickness, but all the rest of the piers are quite free from the old ones.

534. Would or would you not be foul of a disturbed bed caused by the coffer-dams, and the materials which were put round those coffer-dams to form the new piers?—No, I think there would be no difficulty from that cause. Mr. Walker did not do much under the base of the piers but fill them in.

535. I am speaking rather of his having probably left in a good many piles between the piers which were not drawn?—I think there will be no difficulty arising from that cause. I have had myself a bridge to build in two halves, which I consider a more difficult thing than this.

536. Where was that?—Over the Calder. We had upon the Lancashire and Yorkshire Railway a timber bridge, which decayed, as timber bridges will, and we decided upon a stone bridge; it was at a place where I suppose 150 trains a day were passing; it was in spans of about 55 feet, and we built three arches; we built one-half, and then removed the old bridge and built the other half, and those two halves are now one bridge.

537. What was the nature of the pier?—All stone; we built half the pier and half the arch in stone. Formerly tunnels used to be constructed in separate

separate pieces, with square ends, fearing a settlement, but I do not always do that now. I bond the one part of the tunnel into the other, and I find no difficulty in it.

538. Have you heard the suggestion of booms to protect this bridge?—Yes; I cannot see what they are wanted for. I do not see the necessity for booms, certainly not, if the course of granite which I have alluded to were built round the upper part of the pier.

539. Mr. Fowler said that in one matter he did not quite agree with you; that he fancied that if the iron casing were entirely destroyed by the lapse of time, no ill consequence would follow, because the concrete would maintain itself; but is he aware that it is not concrete; that, on the contrary, there is an interval of four or five feet thickness of gravel itself?—I am aware of that; and that is what made me consider that when the plates are gone, you should provide other plates.—(Mr. *Fowler.*) I am quite aware of that; my answer is entirely founded on the assumption (which I think a reasonable one) that long before that time the bed of the river will be at a permanent level.

540. Presuming that it scours out, as it is believed apparently by Mr. Page, who is an excellent authority upon that subject, down to the clay, and that the plate is eaten into, you will have no concrete but gravel, and if the water flows in and out it will carry the gravel with it, and undermine the bridge?—No doubt.

541. Do you think that it should be watched?—You may begin to watch it in 150 or 200 years.

542. And until that time, no accident of that kind need be apprehended?—Certainly not.

543. Colonel *Boldero.*] (To Mr. *Hawkshaw.*) If you had authority to build a bridge on a given spot between Vauxhall Bridge and Westminster Bridge, would you build it by coffer-dams, and if not, what plan would you pursue?—It would depend upon my instructions. If I were told to build a bridge without limitation of cost and time, to make the best structure I could make, then I should build it with coffer-dams, and wholly of granite.

544. In preference to the present plan?—Yes, if there were no regard to cost or time.

545. Do you consider it desirable to have one uniform headway in all metropolitan bridges?—I think it desirable if we can obtain it.

546. Would it not be very advantageous for the commerce of the river?—No doubt of it.

547. Could you convert this bridge, which has now 20 feet headway, into 25 feet?—No doubt of it; that was the great contest in former Committees.

548. Taking the building as it stands?—Without difficulty; but other considerations would arise.

549. Without adding much to the expense?—I do not know how much of the superstructure has been constructed, therefore I cannot answer that question.

550. Sir *John Shelley.*] I understood you to say that you did not see any reason why a bridge should be built over the Thames of a more permanent nature and to last a longer time than bridges which were built for the purposes of railways?—No; I think the structures which have been built for railways are as important; some of them are greater structures in every way. I do not see that we should build bridges across the Thames which are to carry donkey carts, omnibuses, and cabs, differently from bridges for railways, over which trains run at 50 miles an hour.

551. Then are the Committee to understand that, in your opinion, the viaducts and bridges of great railways are really built to last for a shorter time than what would be called permanent structures?—Many of our structures on railways are as permanent, I consider, as any works in the country.

552. Therefore those viaducts or bridges are not built for the purpose of lasting only 150 years, are they?—No; they are built for different degrees of permanence; supposing this were a bridge required for a railway there would be no difficulty about it, and I have no doubt that it would be taken in hand, and finished in two years.

553. Looking at the fact of its being built upon the foundations of an old bridge?—Yes.

554. Sir *Benjamin Hall.*] With dams or without?—Without dams; it could not

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

not be done with dams in the time; coffer-dams would make it very much slower; you could not have coffer-dams all across the river at once; you must have one or two at a time.

555. Sir *John Shelley.*] With regard to building the bridge at twice, you do not fear any difference of settlement; that is to say, that one-half of the bridge being open to traffic, and gaining its settlement, you do not fear a difference of settlement when the other half of the pier comes to be built up against it?—Certainly not; I do not think it possible that there can be unequal settlement, inasmuch as the piles, I believe, will bear many times the weight put upon them.

556. Will there be any settlement at all?—I think not; and I have no hesitation in saying, that if I thought that the proposed mode of constructing the bridge was one which required to have recourse to such a plan as building it in two separate and detached pieces, I should certainly not advise it to be proceeded with; it would be such a lame structure altogether that I think it very much better not to build it at all than to build it in two separate and detached parts.

557. Do you consider that built as this is, there will be no settlement in the foundation?—None whatever.

558. Upon that you rest the opinion which you have just given as to the two halves not causing a difference of settlement; namely, upon the fact, that in your opinion there will be no settlement whatever?—None at all practically.

559. Supposing you were to be wrong in that opinion, and that from any circumstance it should be proved afterwards that there was a settlement, is it not likely that the two halves would scarcely settle down equally?—I think it will be a very ugly thing if there be a settlement, whether it is a settlement of two separate bridges, or a settlement of one bridge, but I do not think such a thing possible. I think that the questions arising out of this bridge have relation to futurity and not relation to anything immediate. I have no doubt whatever of the bridge being stable, and not settling at all, as constructed.

560. Do you give your opinion as to there being no settlement from the experience of former bridges over the Thames?—No, I give it from my own experience. I have built, I suppose, nearly a thousand bridges of one kind and another. You can scarcely refer to former bridges across the Thames, because the present Westminster Bridge and Blackfriars Bridge were built in the worst possible manner; at least I take building in caissons to be the worst possible mode of building; in fact it is merely putting masonry in the bottom of a boat, levelling the gravel as well as you can and sinking it. No one who has examined Westminster Bridge, and who knows what happened after the removal of old London Bridge, can be at all surprised at its moving; it rests upon the top of the gravel, and the gravel is washed away. I remember, 20 years ago, going under one of the caissons of Westminster Bridge. I could have crept under it when one of the coffer-dams was dry.

561. (To Mr. *Fowler.*) I understood you to use the words "improper works" as regarded anything that should produce a scour upon the bed of the river?—Yes.

562. And particularly as regarded the Thames embankment scheme; provided it produced any scouring, you termed any work which produced scouring an improper work?—No, you misunderstood me; the Thames embankment, I think, would produce an alteration in the scour or current of the river. What I meant by an improper scour would be such irregular erections as would cause a deep scour at any particular point. The river may be deepened in its bed considerably over its whole width at the new Westminster Bridge, without affecting the structure in the slightest possible degree. What I meant was such an irregular and improper projection as would direct the current to any particular point, and there scour out a deep channel.

563. Sir *W. H. Jolliffe.*] (To Mr. *Hawkshaw.*) With regard to the construction of these piers, you have already stated that the material is amply sufficient to support any weight to be put upon it according to the present plan?—I think so.

564. Would you consider the iron the most perishable of the materials employed?—I should say so; it is exterior to the other materials. It is well known that wooden piles below low-water mark last almost an endless time. The old London Bridge had been standing for 600 or 700 years upon piles with loose

loose rubble thrown around them. Therefore the iron is the most perishable from the fact of its being exposed to the atmosphere and to the effects of water.

565. Do you consider that it is objectionable that this iron should have been made not only the casing to the bridge, but part of the support of the bridge? —I do not think that that is the case in any important degree. I do not think that the bridge is carried by the iron. Certainly it is not in the slightest degree necessary it should be so. That part of the pier excluding the iron is amply sufficient to carry three times the weight of that bridge. I look upon the iron merely as a casing to protect the interior of the pier; it has no other function in my mind.

566. According to the plan which we have before us, you are aware that the granite slabs on the top of the iron casing rest upon the piles and that iron casing?—I am aware that that is the case. Mr. Page appears to have used those slabs rather in lieu of plates. In the Chelsea Bridge, for instance, he would have filled it up with a plate. For reasons which he thinks are sufficient, and which I do not demur to, he has, instead of putting an iron plate here, put a granite slab. I still look upon it as only performing the function of the plate, namely, to keep the interior protected from the exterior, from the water. There will be some weight upon it, but there need not be. I am quite sure that the interior of that pier, irrespective of it, is quite sufficient to carry the weight.

567. You think it would have been more desirable that the iron casing should have been more entirely separated from the superstructure?—No doubt that would have given great facilities, looking to the arrival of the period when you might have to replace that casing. I have alluded to a slight alteration of detail. I should prefer the granite being a little lower; the more it is rendered independent of the iron work, the better. There is no difficulty in doing that; it is not necessary that the bridge should rest upon the outer shell.

568. Two-thirds of this granite slab rests upon this outer shell; do you think that objectionable or not?—I should have made the granite slab shorter. I would then have another course of granite, so as to have a larger surface of granite to resist the shock of boats.

569. We have had it described to us that these iron piles are 15 inches in diameter and of the substance of an inch?—Yes.

570. And that the plates are also of the substance of an inch?—Yes.

571. Do you apprehend that it would be very difficult to drive these iron piles so correctly as to allow the plate to slip between them with an equal bearing?—No, I think not. Mr. Page seems to me to have done it very successfully already, and I have no doubt he would continue to do it so. I see no difficulty in doing it.

572. From what I gather from your evidence they are not so closely fitted as to be water-tight?—No, you could not get that unless you caulked them with iron cement.

573. Therefore the corrosion would act upon all sides?—I have assumed that, and in doing so I think I have assumed the case against the bridge. For instance, Mr. Page in the first place fills the interior of his piles with concrete, and the concrete which he makes is of such an excellent quality that I think it is almost too much to suppose that the water will come in contact with the iron so as to do any harm. The same thing applies to the plates to some extent, but there is a portion of the back of the plates which only comes in contact with gravel. No doubt in the gravel the water would come to the back of the plate; in my answers upon that point I have always assumed that the water will get to both sides of the iron, which is, I think, assuming the case against the structure. I think it is safer to do that.

574. What is the calculated toothing of the plates into the piles? —I think about two inches, judging by the eye; I have not measured it; about 2 ½.

575. Mr. *Tite*.] What is the depth of the groove?—The groove would be 3 ½ inches, and the pile about 2 ½ inches.

576. Sir *H. W. Jolliffe*.] And that would be sufficient to resist for a certain length of time any decay by corrosion loosening the plate?—Yes.

577. At the same time, of course, corrosion would to a certain degree loosen this plate in this groove, and therefore would admit the water?—There is less chance of corrosion when cast iron comes in close contact with cast iron,

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

because the oxide of iron forms a sort of cement, and therefore the corrosion would not go on there so rapidly as with an exposed surface.

578. What is the height of the granite slabs?—Eight feet.

579. And what is the thickness?—Eighteen inches as shown upon the drawings, or nearly so; they are not always precisely that, but about 18 inches.

580. Then one foot of this granite slab out of the 18 inches would rest according to this plan, upon the top of the iron?—Yes, upon the top of the piles.

581. Among the slight alterations which you say you would suggest in carrying out this work, would you suggest that for those piers which were not so far completed as to render it necessary for them to be carried out in the manner commenced, this iron casing should be made altogether independent of the support which it now gives to the granite superstructure?—I do not think that is essential, because all that I think need be considered upon that point, is the practicability, should that course be necessary, of putting another casing round the present one, which would be done I think as easily with the casing as now constructed, as with any change; that is a very remote question; what I mean is, that supposing in the course of a long period of time those plates decayed, there would be no great difficulty in putting another casing.

582. In what condition are these piers now; are there any of them carried up to the top of the concrete?—Yes; there is one pier which is ready for the first course of granite; there are four piers in different states; in two cases you see the tops of the piles exposed previously to putting the blocks of granite upon them; in another pier the blocks of granite are placed upon the top of the pier and the spaces are filled up with concrete, and there is one ready for the course of granite.

583. Are those piles and piers carried up now to the present low-water mark?—Yes.

584. And are those piers, which have been so far completed, sawn off at the present low-water mark?—In some cases; there is one case where the piles are just as they have been driven; they have not been sawn off.

585. How many of these piers are carried up to the low-water mark?—I think there are four, but not all in the same state of completion; there is only one where the concrete, I think, is completed to the top.

586. To what depth were you able to examine that concrete?—The concrete is as hard as flint; we had a sharp pointed rod and you could scarcely produce any effect upon it; we had a little of it picked up; it is extremely hard, as hard as stone.

587. Mr. *Tite*.] I think the honourable Baronet meant that the granite springing course rests upon the tops of the piles and then externally upon the granite slab, and that again rests upon the iron below?—Yes.

588. I think the question was asked you, whether you thought that the external stone took a bearing, as well as the internal piles and stones, upon the piles, and you said that you thought it did not; do you still adhere to that opinion?—No; I believe that the springing course of granite will rest one edge upon the granite slab.

589. And that granite slab takes a fair share of that weight, does it not?—No doubt; but I believe that the load of the bridge is not more than about 2 or 2¼ tons to the square foot, excluding the granite slabs, taking the interior of the pier interior to the granite slabs.

590. You consider that the granite slabs would take a fair share of the weight?—Yes.

591. *Chairman*.] Has it been brought to your knowledge that any considerable bridge has been built with piers of such a construction as proposed here under circumstances in any way similar?—I do not remember any bridge constructed precisely on this principle. There are a number of bridges constructed upon analogous principles; for instance, the Rochester Bridge, which has been built by Sir William Cubitt, rests upon cast-iron cylinders, which are sunk into the ground, into gravel in fact; they are then filled up only with concrete, and upon the tops of those cylinders a springing course of granite is laid, and the pier is built exactly in the way here proposed.

592. Mr. *Jackson*.] If those cylinders were knocked away, do you think that the concrete would be sufficient to bear the weight?—I should not like to put a bridge

a bridge upon stilts of concrete; I have used cast-iron cylinders on the Thames, for a bridge which I have just been building at Staines; there I put in brickwork and cement.

593. Mr. *Tite.*] With the cylinders in the intervals?—Yes; that is better; but I should not like to see a bridge standing upon brick stilts or concrete stilts, without the cast-iron cylinders; I think it would be an awkward looking thing, at all events.

594. Mr. *Jackson.*] Independently of that, would it sustain the bridge?—I think the brick-work would; I do not know that the concrete would, if you had a column of concrete 30 feet high; it would be sufficient to sustain it so long as it was surrounded by the gravel; but if you washed away the gravel, and left a column of concrete standing that height, it would not be sufficient.

595. Sir *W. H. Jolliffe.*] With regard to the desirability or practicability of proceeding with this work, I think you gave it as your decided opinion that there was no great difficulty in carrying out this work as designed, and that if it were designed for a railway, you had no doubt that it would be completed in two years?—I think so; I have no doubt of it.

596. Does it follow from that that it is your opinion that the works have been stopped without any sufficient grounds for their being put an end to?—I am not aware how the works were stopped; I always understood that they were stopped in consequence of the failure of the contractor; I know nothing of the circumstances of the stoppage of the works.

597. You do not consider that they have been stopped from any necessity as to the practicability of carrying out the design?—I really cannot answer the question; I do not know the motive of their being stopped; I understood that they were stopped because the contractor failed; I know no other reason. I have not at all gone into the history of the bridge.

598. No examination which you have made of these works suggests any other reason to you?—No, I see no reason for stopping the works. As I have said before, there are little details which I should change; but I think every other engineer would do the same, if you asked half a dozen their opinions.

599. Sir *Benjamin Hall.*] Would you advise that the work should be carried on as originally designed?—Yes. As I have said, there are one or two details which I should alter, but they are so small that I do not consider them as at all altering the principle.

600. Will you state what alterations you would require to be made in the original design?—What occurs to me I have almost explained already. I should like the wooden piles left shorter. There are granite isolated blocks placed upon each pile, and the interstices between the blocks are filled up with concrete. I can see no reason why those blocks, instead of being separate and detached blocks, should not be a solid course of granite, extending all across the pier, and projecting sufficiently to make a fender against boats, and upon that the other large course could be arranged so as to get a granite face of three feet deep or four feet deep, without any alteration of the plan. I think that would be an improvement.

601. Mr. *Tite.*] A granite platform?—A granite platform; in fact it would be a granite platform double the thickness it now is, taking it down so as to get a course of nearly five feet of granite.

602. Sir *Benjamin Hall.*] Is that the only alteration you would suggest?—That is the only one that occurs to me. I have not at all looked to the superstructure; I know nothing of the upper part; I have simply looked at the foundations; therefore I must be taken as giving no opinion whatever about the superstructure; I have not even seen the work which has been done. But with regard to the foundations which I have seen, it occurs to me that this course of detached blocks would be better as a continuous course of granite platform.

603. Have you not looked at the plan of the superstructure?—No; I had not time. I did not feel that I could give sufficient time to it to form any opinion about it: therefore I have refrained from looking at the superstructure. Besides, I understood that the question was simply as to the foundations. Allow me to say that I am loth to suggest an alteration, because it would require a careful consideration of the details. I have scarcely had time to form a very confident opinion as to the precise mode in which I would make that alteration:

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

but beyond making a deeper granite platform nothing has occurred to me upon looking at the plans. I have no doubt that when it came to be proposed, Mr. Page would point out difficulties in carrying it out, which would require to be considered, whoever suggested such an alteration; he would show that he had good reasons for leaving off at the depth he did, and there may be practical difficulties in carrying out the suggestion which do not occur to my mind at present. Therefore, in making this suggestion, it should be subject to more careful consideration than I have been able to give to it.

604. Then am I to understand that you, as a professional man, would advise the bridge to be proceeded with as originally designed, with the single exception which you now put forward?—Yes; as regards the foundation; I know nothing about the superstructure; I have not seen it beyond seeing that drawing.

605. *Chairman.*] That would be a mere modification of carrying out the pier upon the existing principles?—That is all.

606. Sir *Benjamin Hall.*] You do not know of any bridge which has been constructed in a manner similar to this as regards the foundations?—Not precisely.

607. You have cited Rochester Bridge; does that bridge present the greatest amount of similarity which you can adduce?—There have been a great number of bridges constructed upon iron cylinders, filled in with concrete in some cases, and with brick-work in others, and I consider all those analogous cases to this; for instance, there is Mr. Brunel's bridge at Chepstow, and there are two or three bridges of that kind across the Thames. I have constructed one myself. All bridges which are supported upon casings of cast iron, and which are filled up with brick-work or concrete, are, I consider, analogous to this bridge in some degree; there are great numbers of bridges of that class; in fact, it has become rather a favourite mode latterly of constructing bridges, where you want to construct them rapidly. I prefer this, I think, to a bridge constructed upon cylinders, though I should not hesitate myself to construct a bridge in the Thames on cylinders; I think that it could be done with security, and so as to make a very good job.

608. To Mr. *Fowler.*) Do you agree with the opinion which has been given by Mr. Hawkshaw?—So far as having no difficulty in taking the responsibility of saying that the bridge is sufficient, and may be built with perfect security and is a permanent bridge, I do, but I also say with Mr. Hawkshaw, that there are one or two little matters of detail which I should alter; one thing certainly I should alter. In one way or another I should get a projection of the granite so as to protect the caps of the piles from the possibility of being injured.

609. Do you think that as at present constructed, without some protection of that kind, there might be danger?—I should scarcely call it danger, because it would never come to that; we should provide against it.

610. Then why should you desire to put a casing there to prevent collision, if there is no danger?—I would have it permanently built as part of the structure, rather than in the other way.

611. Then you think that as designed it is incomplete?—I do not know whether Mr. Page did or did not intend to put a timber protection to it; it may have been proposed.

612. Is there anything of the kind in the plan?—I do not remember to have seen it.

613. Is there any provision for it in the works?—The works are not now in a state in which it would appear, even if it was intended; the works are not sufficiently advanced.

614. Then in any case you would make that provision at a later period of the work, would you?—No, I think I should do it now; I should build it as a part of the permanent structure; I should put a string of granite to prevent the possibility of collision.

615. Would you do it after the piers are completed?—No, I should do it now.

616. Some of the piers are completed or nearly so, are not they?—No, none of them are so far advanced as to prevent that being done.

617. But no provision is made for it in the design?—I think not, as far as I recollect, in the permanent design; but it is a thing very constantly done in the case of docks and quay walls after they are completed.

618. Is

618. Is there not some prevision in the shape of buoys, or booms or fenders?—I do not remember it.

619. Is not that part of the plan?—I do not remember; it is not a part of o me; I have never seen it on the plan.

620. Was not it part of the original design?—I am not aware.

621. You think a protection is necessary or advisable to the piers, as they are built now?—Yes, and I should myself have built a granite string as part of the permanent structure; but it would answer the purpose if made of timber, as no doubt was intended by Mr. Page.

622. What other alterations would you suggest?—Nothing else occurs to me; I should continue the same care in the work which Mr. Page has bestowed upon it to the present time. For instance, as regards the concrete: the concrete is better and more permanent than the Portland stone used in the existing Westminster Bridge; it is better material. I think it is necessary that that should be so continued.

623. Supposing that the river was quayed on each side, as has been talked of for a great number of years, and was to some extent contracted in its course, do you think that the scour which would be occasioned by such contraction would not interfere at all with the bridge, as designed?—No, and for this reason, that the contraction would be done, if carried out according to the line which has been laid down by the Commissioners, in such a manner that the current would be regular; it would be much more regular, in fact, than it is now; therefore I do not think there would be any tendency to scour at particular places. The bed of the river might be a little deepened, and most probably would be; but that would not affect the bridge in the slightest degree.

624. Have you seen the original design of the bridge?—Yes. I was examined in 1853 upon it before the Committee which sat for many days; therefore I am familiar with everything which relates to this bridge.

625. And you have seen the works lately?—Yes.

626. Will you be good enough to state to the Committee what deviation there has been from the original design?—I am not aware of any, except a small deviation in the span of the arch. If I remember rightly, before the Committee in 1853, which sanctioned the proposition of the Board of Works, the span was 125 feet, and it is now being executed 120.

627. I mean a deviation from the design in the structure?—There is no deviation, of any material character, from the original design, which occurs to me at the present moment.

628. It has been shown that there are common pointed piles applied instead of screw piles, I believe?—I should not call that an important deviation at all. I believe there is that deviation.

629. I am not asking whether they are important or not; I want to know what deviations have been made in the structure from the original design; will you be good enough to state them?—That is one, and the most important that I know. At the same time I must be permitted to say, that it is rather the contractor's mode of doing the work than a part of the engineer's design; it is perfectly immaterial how these piles have been got down. If I were the engineer desiring them to be got down, it would be immaterial to me how they were got down.

630. Has there been any alteration in the depth to which the bearing piles have been driven?—I am not aware that there has. But as to that, again, in all bearing piles engineers rather specify and depend upon the resistance which the piles will make to a certain number of blows of a certain weight, than specify the depth to which the pile is driven; because that is the real test; and until the ground has been tested by actually driving the piles, you cannot determine the proper length for the piles. It is universally the case, that the length of our piles in execution is different from that in the design; they are sometimes 10 or 15 feet longer, sometimes 10 or 15 feet less, according to the resistance which the pile meets with in driving.

631. In this instance they have been driven to a greater depth than originally proposed, I believe?—I do not know. I inquired particularly into what appeared to me the important matter, namely, the number of blows given to each pile, rather than the depth to which they were driven. The test applied is a very severe one, much more severe than is used for bridges of much greater weight

J. Hawkshaw, Esq. and *J. Fowler*, Esq.

18 July 1856.

in their foundation than this; that is the real test, and not the length of the pile.

632. Is there any alteration in the masonry above the bearing piles?—I am not aware of what alteration there is. I should not call the alteration of the piles any alteration in the design at all.

633. I ask you whether there is any alteration in the masonry above the bearing piles?—I am not aware of any. In 1853, the plan which was discussed before the Committee was necessarily a skeleton plan, the great object being to determine the span and the height of the arches, not the details of construction.

634. As to the granite band which we have heard so much of, is there any alteration in the thickness of that?—No, I think not; I think it is quite thick enough.

635. But is it the same as was originally designed?—I do not know.

636. Will you look at the plan and let me know?—I am told there is no alteration.

637. There was to be an iron curve in the original plan; is that carried out?—I am told not; in the working drawings for the original plan there is shown a granite slab.

638. And no iron curve?—No.

639. Is there any substitution of brickwork in the cells or the arches of the piers instead of concrete, as originally proposed?—I think not; nothing of this kind was explained before the Committee of 1853.

640. Sir *John Shelley*.] You were examined before the Committee in 1853?—Yes, at considerable length.

641. Do you know what plans were before the Committee at that time?—Yes; the skeleton diagram plan, made for the purpose of showing the span of the arches, and the headway above the water.

642. Were you at all examined before that Committee upon the question of the construction of the bridge, or were you examined more upon the question of the gradients over the bridge, and the headway as regarded the bridge?—Entirely on the question of the gradients over the bridge, and the headway under the bridge, not at all upon the question of construction; it was not inquired into, in fact, before the Committee.

643. Sir *W. H. Jolliffe*.] What headway did you recommend?—The headway adopted, namely, 20 feet. I was examined on the part of the Board of Works.

644. Sir *John Shelley*.] Are you able to tell this Committee what alterations have taken place from the intentions with regard to the construction which were brought before that Committee, and as regards the way in which they have been carried out?—I should say none; the substitution of driving piles for screw piles is not an alteration of design, but an alteration in execution. I should call it no change whatever.

645. Then, in your opinion, there have been no changes made?—No, except the trifling alteration of span I have mentioned.

646. Do you mean that there have been no changes made as regards evidence given upon construction before that Committee, or do you mean as regards the plans which you have seen since?—I mean that there has been no change in either respect. The only thing which I should say was mentioned before the Committee, and which seems to me almost a part of the design, is that coffer-dams were not intended to be used. It was an object to get the headway as low as possible, and to have the bridge as flat as possible, to enable that low headway to be made; therefore small arches were made, and small weights were put upon the piers to enable the coffer-dams to be dispensed with. If coffer-dams had been intended, no doubt there were would have been a totally different design; for instance, there would have been most probably three openings instead of the present number.

Thomas Page, Esq., called in; and further Examined.

T. Page, Esq.

Mr. *Page*.—I have nearly completed a written statement for the Committee, on which I should prefer to be examined on any day which may suit them. I much prefer that course to giving desultory evidence. So many different opinions have been expressed that I think it is due to the Committee that I should allude to all of them in this statement.

647. Sir

T. Page, Esq.

18 July 1856.

647. Sir *Benjamin Hall.*] Will you be good enough to state to the Committee what alterations have been made in the structure from the specification?—I stated when I was last examined, those alterations; that the piles, which were to be screwed or driven according to the specification, on that part of the structure first executed, were driven and not screwed; also, that instead of using the old ship oak timber for the roadway under the granite, I proposed to use wrought-iron plates. Another alteration is the omission of three large cast-iron ribs in the bridge, and in place of them substituting the ordinary rib, which consists of haunches of cast iron and centres of wrought iron. All that I should go into and state very clearly to the Committee in my paper, and the reasons why I did so, and if the Committee wished it, the difference of expense. Mr. Fowler has been examined as to the difference in the design. The design, as I explained to the Committee before, which was submitted to the Committee of 1853, was merely a diagram showing the spans and headway of the arches; it took no cognizance at all of any detail.

648. With regard to the specifications upon which the contract was founded, what other alterations have been made in the structure from the specifications?—A large granite plinth course has been substituted for the cast-iron curb round the pier. I consider that every engineer in the progress of the work, if he sees that he can improve the construction, has a right to do it, and that if he has not that power he ought not to have charge of the works.

649. What other alterations have been made?—I cannot specify other alterations. The piles are driven deeper than shown on the contract drawings, but not deeper than required by the specification. These are not alterations, they are extras.

650. Sir *John Shelley.*] Is not there an alteration in the spans of the arches?—I mentioned that the last time I was before the Committee.

651. Sir *Benjamin Hall.*] Has there been any substitution of brickwork for concrete?—Not yet; the piers will be built up with brickwork instead of concrete. When I say that the piers will be built up with brickwork, there were spaces in the piers, as in Hungerford piers, left to be filled up with concrete; those spaces are proposed to be filled up with brickwork instead of concrete. With regard to the concrete, I thought that it would be interesting to the Committee to see a specimen of this concrete, about which so much has been said. I would in fact entreat the Committee, in justice to me, to go and see the works at low water. I think that without seeing the works at low water, they could not have that correct idea of them which they would have after seeing them, and which they ought to have.

652. Are there any other deviations from the specifications as regards the piers?—I do not recollect any. When you speak of the specification, the specification gives the engineer power to alter, and these alterations I have named are all within the specification.

653. What I want to know is, what deviations have been made in the work from the specification?—I have stated all that I recollect; and what I say is this, that I will make out a list of them in my paper, and the Committee shall have every information upon the subject that I can give.

654. Mr. *Tite.*] You believe them all to be improvements?—I do. I am satisfied that they are all improvements; I am satisfied that every engineer (if you referred to Mr. Stephenson himself, who has been referred to by the Committee,) would be satisfied that they are improvements.

655. Sir *Benjamin Hall.*] I do not question their being improvements, but I want to know what deviations have been made; will you be good enough to put them in a list by themselves, setting forth what deviations have been made in the structure from the specifications as handed over to the contractor?—I will do so.

Vide Appendix, No. 3.

656. Colonel *Boldero.*] What are the terms in your contract with regard to deviations from the contract?—That if any deviations are made, the contractor will be paid in addition or in deduction, according to those deviations; and that if the alteration involves the use of any material or labour which would not come under his schedule, he shall be paid according to the prime cost of such material or labour, with an allowance of not less than 7 ½ per cent., to be settled by the engineer.

657. What control is there over you in directing deviations; is there any?—The

T. Page, Esq.

18 July 1856.

—The specification provides that there shall not be a change of plan without the consent of the Lords of the Treasury; but these are not changes of plan.

658. Have you the power of increasing the expenditure to any extent you like?—I do not read the specification so; I believe that it will be found that I have not increased the expenditure, but the contrary. The bridge can be completed for very nearly the contract sum, and by very responsible contractors.

659. For instance, if you made an alteration involving an extra expenditure of 10,000 *l.*, you must go to the Treasury to sanction it?—I should submit it to the Chief Commissioner.

660. *Chairman.*] You are aware of the evidence which has been given, in which it has been stated that it would be desirable to cut the piles off below low-water mark, instead of letting them come a foot above, as is proposed, I think, in the specification which we have had before us?—Yes.

661. Have you any observation, and if any, what observation to make upon that, whether you consider it desirable or not?—The low-water line shown in the drawing is a very low tide, an 18-feet tide, and the piles stand at some six inches above that line; but the mean low water of the river is above the line of the piles. Still there may be some objection upon that point worthy of attention, and more especially I admit that, because Mr. Stephenson himself has pointed it out. There is no difficulty in making the alteration, and there is no objection whatever, upon my part, to adopt any modification which can be shown to be an improvement to the structure, and a benefit to the public.

662. I am not asking whether you object or not, but as to your opinion, if the low-water mark which you have stated is, in fact, such that it leaves the piles at times to be above water, whether you think that they would be liable to decay, or not, in that position?—No; cased in as they are in the midst of the concrete, I do not think that they would be liable to decay.

663. When shall you be able to put in the paper to which you have alluded?—I will endeavour to prepare it for Monday.

664. You have had every facility for acquiring a knowledge of the evidence as it has gone on from time to time, and we ought to have your paper by that time?—I was only furnished with a copy of Mr. Rendel's and Mr. Simpson's report two days before the Committee met, therefore I consider that I have had very little time indeed given me to make any answer to that report, especially as I have been engaged in going through matters with engineers. I am also, I think, what I may call injured by the Committee not allowing me to call any engineers beyond two, and by the Committee not taking evidence of facts, instead of taking mere opinions.

665. What evidence of facts could you have brought to our knowledge?—Mr. Rendel's statement the other day was that the low-water line of the sea would become the low-water line of the river, and the inference was, that a great scour in the river would take place before that limit could be attained. I say that that statement gave an impression that there will be danger resulting to the foundations of Westminster Bridge in consequence of this great scour. Coming from a man in Mr. Rendel's position, of course it had weight with the Committee; I pointed out to Mr. Rendel, not in the way of cross-examination, but told him that the low-water in the Pool had arrived at the low-water at the mouth of the Thames at Sheerness. When Mr. Rendel makes a statement, for instance, such as that with reference to the low water, or as to the piles driven into the London clay becoming loose, I say that that statement ought to be proved, and that the Committee, I would not say have no right, but I do not think that the Committee, on consideration of such a subject, should take an opinion unless it were confirmed by a fact.

666. I ask you what facts you wish to bring to our knowledge that you have not had an opportunity of bringing; you are stating opinions which have been given; it was quite open to you to have brought any engineers you could before us who could prove any fact that you wanted to prove?—I understood not; it was distinctly stated to me that I was limited to two engineers, when 10 engineers would have given evidence in favour of my plan.

667. You were told that you might bring two engineers, or otherwise: if those gentlemen could have proved facts, we should have been very glad to have heard their facts; but they have not suggested any, nor have you?—I have plenty of evidence upon facts about the scour of the river, and the precautions

cautions which were taken at London Bridge against the scour; I have the evidence of a very experienced man, Mr. Plews, who was the contractor; I would ask the Committee to examine him. *T. Page*, Esq. 18 July 1856.

668. That very fact which you are speaking of about London Bridge was brought out here in evidence by one of the witnesses, who stated that the gravel had remained in the state in which it was left; that fact has been given in evidence?—That witness could not give the express evidence which Mr. Plews can give; I do not know who the witness was; then there is the evidence of Captain Maughan, of the London Docks, upon the state of the tides; because the tidal action of the river must necessarily very much influence the question before the Committee.

669. Any evidence which could be given upon the subject of the tides, and the probable influence of the tides upon the bed of the river, would after all only be opinions?—No; they would be facts.

670. The tides would be facts, but the results which might happen from them would be opinions, would they not?—And the changes which had taken place in the bed of the river would be facts.

671. What it is now would be a fact; but what it would be hereafter would be a matter of opinion?—I think with all due deference to you, that the hereafter would be limited to a very small space of the future, for the alterations in the river.

672. But that is a matter of opinion whether it would be small or great?—It would depend upon the rise and fall of the tide at Westminster Bridge compared with the rise and fall in the Pool, and it would depend upon the rise and fall of the tide in the higher districts of the river also compared with the rise and fall in the Pool, so that when the river, say at Westminster Bridge, is governed by the laws which govern the tidal action in the Pool, then Westminster Bridge may be considered as in a similar position in relation to Sheerness as the Pool is; that is, that the tidal action would be pretty much the same; the low-water line would be attained at Westminster Bridge almost as low as at Sheerness, and therefore no danger need be apprehended from changes in the river bed.

673. *Chairman.*] That fact has been stated by the witnesses here to-day; the fact that, in their opinion, no great change is to be expected in future in the bed of the river; that has been stated by the two gentlemen who were examined to-day, and it is only opinion.

Robert Stephenson, Esq., a Member of The House; further Examined.

674. *Chairman.*] WHEN you were last before the Committee, you wished to see the works before giving us any opinion as to whether, in your judgment, it would be more advantageous to the public to go on with the present plan of building the bridge, or to abandon that plan, and undertake putting in solid granite piers for that bridge or any other bridge founded deep in the London clay; you requested before you answered that question to see the bridge; have you seen it?—I have. *R. Stephenson*, Esq., M.P.

675. Having seen it, what advice would you give the Committee as to the most desirable course for them to pursue, taking into consideration the circumstances, the probable expense, the money which has been laid out, and the future permanency and security of the structure?—I went yesterday morning over the works with Mr. Page and two other engineers, Mr. Hawkshaw and Mr. Fowler, at low water, and had the whole of the proceedings explained to me very fully indeed and in great detail as regards the piers and the foundations. I afterwards visited Battersea Fields with a view of examining such portions of the superstructure as have been put together. I was engaged during the remainder of the day in making calculations upon the subject, and although I have arrived at certain conclusions, yet on such a large question, in one day, I think the Committee would hardly expect me, and indeed I should not wish, to give any very positive opinion on the matter. With regard to the character of the works which have already been done, I feel it quite necessary, after what I said the last time, to say that they have been done in a very masterly way. There are differences of opinion between Mr. Page and myself, but they are of minor importance. I will recapitulate them, and make a remark or two upon each point, if you will permit me, in order more fully to explain the precise import that I

R. Stephenson, Esq., M.P.

18 July 1856.

wish to give to the opinions which I submitted to Committee at their last meeting. For instance, with regard to the bed of the river, that was one point; then there was the question of coffer-dams; there was the construction of the pier; there was the building one half of the bridge without the other half; and then there was the question of the expansion of the iron work. Now all those points, I believe, formed more or less matters of difference between the mode adopted by Mr. Page in the construction of this work, and those general opinions which I gave to the Committee; and the few remarks which I will make now would be rather to guard against those general opinions being applied very specifically to this particular case. With regard to the bed of the river, one of the Members of the Committee asked me whether if a heavy scour should take place, there would not be some danger of the gravel being worked out from beneath the concrete, the question assuming that the scouring did take place, and would take place to the extent supposed to reach down to the gravel. I necessarily had to give the answer to that question as a general one, that of course the foundations would be endangered. I will refer back to Colonel Lloyd's Levels, which he took on the tides of the Thames; they were published in the Transactions of the Royal Society, in 1831. I will not trouble the Committee by referring to them, but merely make the statement. They were also made use of by Mr. Page in a Blue Book, in 1854, probably the one which the Honourable Member, Sir John Shelley, referred to this morning. I have had them all brought before me, and the facts are so simple and so clear in my mind now, that I will just lay them before the Committee, to show them that I think that the scouring really could not take place. It is evident that, as regards the scouring of any river, when you remove obstacles from it you increase the quantity of water flowing from the sea, and increase the quantity of water which must flow back again; therefore the velocity is increased, and consequently the scour is increased. But that can only go on in those parts of the river where the low water is considerably above the low water at sea. Now, I find, on referring to these levels (I was not aware of it before, but my attention was called to them by Mr. Page, and I went very carefully through them), that the low water in the Pool has arrived within two or three inches of the low water at Sheerness. The low water at Westminster Bridge at present varies, say from eight to 10 inches; it is not worth while going into inches; but that fact alone satisfies me that not even the coarse gravel of the Thames or the fine gravel will undergo any great change of level by any change that you may make between London Bridge and Westminster Bridge. Even the formation of quay walls between those bridges, and improving the form of the river in every possible way in that distance, could not produce more than 10 inches lowering of the tide. Therefore that increased scour, I am perfectly satisfied, would not endanger the foundations of the bridge even as laid by Mr. Page; consequently that question to which my general answer applied is negatived by what I am now saying.

676. Further consideration has led you to the opinion that there is no reason to apprehend any change in the bed of the river?—None of any consequence.

677. So that any observations which you may have made as to the future effect upon the pier by a change in the bed of the river, you wish to modify and correct?—Just so. You will bear in mind that the question was put to me in such a way, that I could only give to it the answer which I did. Then the next question is as to coffer-dams, and that I attached importance to. After hearing Mr. Page's explanation, I felt that my answer respecting the coffer-dams was not quite correct towards him. It appears that great discussion took place with regard to the spans to be adopted in the arches of this bridge in the first instance. I think Sir Charles Barry had some view upon it, and other parties. The spans were reduced in size, I do not know by whom. However, if a design is to be carried out with spans of, say 120 or 130 feet, which is about what they are now, then the answer which I gave respecting the adoption of coffer-dams would not apply at all. If I had been called upon to design a bridge in such a situation, I should have taken care to have made the spans as large as possible, and to have used coffer-dams; but to use a coffer-dam now with such spans, would actually fill the river up; you could not do it. Therefore if you once fix the spans to be adopted, you negative the adoption of coffer-dams.

678. On

678. On account of the obstruction to the river?—Yes; therefore the application of the answer respecting coffer-dams requires a little modification.

679. I think also you have distinctly stated in your former evidence, that in your opinion, the security of the work could be well seen to by means of divers?—Certainly.

680. I think you gave distinct evidence upon that point?—Very distinct, and I prefer it. But then in order to reduce the contingency of coffer-dams, which is usually very great, I should run the risk of putting larger arches, putting, perhaps six, seven, or eight tons to a square foot upon each pier, instead of two or three, which by the plan of reducing the span of the arches Mr. Page has arrived at. He has diminished the pressure or the danger from subsidence by reducing the arches. I should have preferred very much to have made coffer-dams, and to have made arches with 200 feet span at least.

681. You would have liked fewer piers but stronger piers, and larger openings?—Just so, and taking more care to have made a permanent foundation a very long way below the reach of any atmospheric change. With regard to the construction of the pier, importance was attached to that. In building a pier, I think engineers ought to adopt the general principle of arriving at something like homogeneity in the parts which have to bear a uniform weight; therefore I suggested that the mixture of wood and concrete and iron (iron being here for the first time, that I have seen, used for the purpose of enclosing the piers, and at the same time of bearing piles), was the novelty of the case; now although one or two of the piers may have been finished in that way, I do not recommend its continuance in that shape, nor would Mr. Page I think, probably, after what has passed, adhere to it; but I do not attach very much importance to that, because I have taken the area of the pier within the shell of granite, and assumed that the granite plinth placed upon the pier top as now finished, should not bear upon the granite shell outside: that it should be merely a projection over that, and therefore that the inequality of pressure should be avoided by confining the weight of the bridge entirely to that space within the granite shell. The open joint might afterwards be filled up with cement after the bridge has come to its bearing; I therefore do not attach much importance to that, because taking that limited area of pier, and taking the weights of the bridge, which have been partly calculated by my assistant and supplied partly by Mr. Page, I find that the weight would not exceed 2¼ tons per square foot; that it would not quite reach that; that is a great deal less weight upon those piers than exists in the building in which we now are; there is scarcely a good house in London which has not fully as much weight as that upon its foundation; I do not therefore think that there is any great apprehension to be based upon that circumstance.

682. You agree in the statement which has been made, that so far as regards bearing the weight wholly detached from the iron and granite casing, the piers are amply sufficient to bear the weight?—Amply sufficient. Then there was a very general question put to me, which perhaps I was a little unguarded in answering. I will not quite say unguarded, but it would have been perhaps as well left until I had known more of the facts. I mean as to building one-half of the bridge before the other. Now the foundations of the old bridge were, I believe, explained to the Committee as having been very much disturbed by the process employed by Mr. Walker in underpinning the old piers which had given way. I did not see that process going on, but underpinning conveyed to my mind something like a substantial piece of masonry being put under the old pier and going down to a greater depth. But it appears that there was no actual underpinning, but that the vacuities were filled up by material which the engineer thought would be sufficient to prevent further subsidence going on I have seen the plans of it since, and therefore I venture now to express an opinion before the Committee. I made it a point to examine the plans, and also to get information from those who were actually in the coffer-dams whilst those repairs were going on. I think that probably there would be more difficulty than Mr. Page contemplates in building the second half, but I by no means think, and I did not say the other day that there would be any insuperable obstacle. He might be driven to additional expense beyond what he anticipated, in consequence of the foundations having been disturbed, but they have not been disturbed by any means to the extent that I then thought they had.

R. Stephenson, Esq., M. P.

18 July 1856.

683. The old caissons of Westminster Bridge rested upon the gravel, did they not?—They did.

684. When the coffer-dams were put round to carry on what is called underpinning, did they then go below the gravel, or did they fill in in the way you have described upon the gravel?—They filled in upon the gravel. I understand that there were certain vacuities underneath the caisson in the gravel; the gravel had been washed away, and the parties took every means of filling up those vacuities by some solid material, such as masonry, and I suppose with cement, and they concluded that that being done the foundation was perfectly sound.

685. The water had, in point of fact, underwashed the caissons in part?—In part.

686. And had formed partial spaces under the solid piers?—So I am informed.

687. Mr. *Tite.*] Did they put sheet piling round that?—Yes, they put sheet piling round, and they also had a fore-shore all round the pier of large stones, so as to protect it from any further washing. But then I apprehend that by the first process they had not filled up all the vacuities. I understand also that the piles were drawn. The great question at one time was whether the piles had been drawn in the dams. I believe it is quite certain that they were drawn. If they were drawn, then the subsidence which has taken place is easily accounted for.

688. *Chairman.*] In that case also, having made further examination, you consider that the difficulty in carrying out the second half of the bridge would be less than you anticipated when you gave your evidence before?—Yes; I think so. The only other point is the fifth point, with regard to the expansion of the iron and the means for meeting it. I discussed this point with Mr. Page, at Battersea yesterday, and I think that he takes my view that some further provision is necessary, but I do not think that it will require any alteration in the present design.

689. I think when you stated before that you thought provision ought to be made to allow for the expansion and contraction of the iron, you said that it was a matter which could be arranged without difficulty?—Precisely. I think so still. I do not know that there are any other points which call for notice. With regard to the main question whether I am prepared to advise you whether to go on or not, you know what time I have devoted to the subject, and as far as the attention which I have been able to give to it goes, I should certainly hesitate very much in advising you to stop. On the contrary, after having examined the work, I think that you have nothing to fear in going on with it. I have omitted one point with regard to the concrete which now composes the piers. It is harder than Mr. Fowler said, for I tried a little myself on the spot; it is a great deal harder than the stone of the old Westminster Bridge, or than it ever was; there is no chance of any decay taking place there.

690. I understand that the result of your examination is this, that you think the piers, so far as stability and power to carry their weight are concerned, ample; that any doubt which you may have would be as to the question of the durability of the iron casing upon which you have not qualified your evidence, as far as I gather it, from what you gave on the first day; but that on the whole, you would have considerable doubt in recommending the giving up of the plan?—Yes. And I do not know whether I should not recommend, if the iron piles are used, that they should be used independently of bearing piles. I still attach great importance to having the piers homogeneous, or nearly so.

691. That is a modification of the plan, which, as we have heard, would be very easily carried out?—Very easily.

692. The only question which seems to rest in your mind is as to the probable durability of the iron, exposed as it is to the action of the water?—Yes. If the iron were used outside, as it is very frequently used by engineers now, it would be easily replaced, but I consider that inside it would be very difficult to replace it. Upon the question of the decay of the iron, whether it is 50 years or 100 years, I do not enter into, but you are putting something into a part of the pier, employing a material in fact in the pier with stone and wood, which I think is undesirable.

693. Then if I understand you rightly, your opinion is, that if the bridge is carried on upon the present plan, with such modifications as you have suggested,

gested, the greatest inconvenience that may arise will be, whether it is 50, or 100, or 150 years hence, from the decay of the iron, which may have to be replaced?—Just so; but you will understand, at the same time, that the general principles which I before laid down as regards the construction of bridges, in an engineering point of view, I adhere to.

694. I do not understand you to modify your general opinions at all, but that seeing this work commenced as it has been, a considerable outlay of money having taken place upon it, you consider that the structure if it were carried out upon the piers, modified according to the statements which have been made here, would be secure in strength so long as the iron remained undestroyed by the action of time, or otherwise?—Unquestionably.

695. And that the probable or possible inconvenience which might arise to the public, be it in 50 years, be it in 100, or be it at any time when the iron might decay, would be in replacing that iron?—That is all.

696. Would the replacing of that iron casing, assuming it to be wholly detached from the bearing of the bridge, be an easy or a difficult operation?—It would be an easy operation down at low-water mark if it were free from the piers.

697. If it were detached from the piers it would then be easy to replace it?—Certainly; perfectly easy.

698. I suppose there would be no difficulty in seeing from time to time, by an examination by competent persons, whether or not decay was going on?—No difficulty whatever; in fact I adopted that process myself, at the high level bridge at Newcastle. Mr. Harrison, my coadjutor in that work, constantly keeps his eye upon the foundations, which are of a precarious nature, as I explained the other day. The bridge is 120 feet high; it is supported by piles very similar to those which support this bridge; it has four or five times the weight upon it, and it is in quicksand where the river scours a great deal, and we are obliged to surround and protect our piles from time to time by throwing in stone and chalk, as they have to do with a great many bridges in a navigable river. As to the level of the piles here I have nothing to say, except that I should not bring them a little above the level of low-water as they are. I think that ought to be attended to; to keep them a little below low-water.

699. I understand that to be one of the modifications which you suggest as almost a necessity; namely, to keep the piles positively below low-water?—I think so. The timber under such circumstances I believe would be imperishable. I may mention that I have examined some of the timber upon which Labelye laid the bridge originally; it consists of pine, and it smells of turpentine as strongly as it did the day it was put down; no change whatever has taken place in that timber, because it has always been immersed until recently.

700. Colonel *Boldero.*] I think a previous witness stated that if the iron corroded and decayed and was altogether removed, there would be no necessity to put fresh iron in; he thought that the concrete was sufficiently hard to bear any weight which would come upon it; do you coincide in that opinion?—The Right honourable Member, Sir Benjamin Hall, I think, immediately put a question as to there being gravel, and therefore the answer was not quite apposite. I would refer to what Mr. Brunel has done at the Hungerford Bridge. I have not the pleasure of laying those foundations before you, but I thought they were interesting, and intended to have brought them. I could not, however, obtain them from Mr. Brunel this morning. The Hungerford Bridge has, I believe, more weight considerably per foot upon the foundations than any, London Bridge, perhaps, excepted; it has certainly as much as Westminster Bridge, or more. There Mr. Brunel did not build on piles, I understand, but built on the gravel, which is quite in accordance with my view expressed the other day, that I prefer wet gravel to build upon to anything else; but it requires to be protected by sheet piling, and Mr. Brunel so protected it.

701. Mr. *Tite.*] Had he a coffer-dam?—He had a coffer-dam outside, but still he built upon the gravel. This piece of iron (*a piece of iron being produced*) is from one of the old caissons of Westminster Bridge; it is a very good sample, I admit.

702. You mean that the granite springing course should be left as an open joint, so that it should not press upon the external ashlar?—Yes, upon the two

R. Stephenson, Esq., M.P.

18 July 1856.

or three piers now finished; but I think upon the others I would leave out the slabs; it is immaterial if you have it edged by an open joint.

703. With regard to the failure of the works done by Mr. Walker, you very much abide by your former answer, that the subsidence is due a good deal to the under part of the pier being left unprotected, the edge being hardened, and probably the dams being drawn, a slip took place?—Yes. I think that is the only reasonable mode of accounting for the subsidence. That there must have been a side motion, is quite clear. When I examined it yesterday morning the piers had not gone down, but they had lost their perpendicularity, I suppose, as much as a foot in one case, or 14 inches.

704. Is that the new part or the old part?—It is a part of two of the piers which were repaired; they were lengthened, I think; I will not positively say that.

705. They were lengthened for the purpose of widening the bridge?—Yes; but I think those two have slidden, one in one direction and the other in the other.

706. When you speak of designing a bridge with coffer-dams and three arches, you are quite aware of the difficulty in which Mr. Page is placed by the desire to keep the bridge exceedingly low as regards the surface of the water and the inclination over the bridge exceedingly level; would that be consistent with a bridge of three arches?—Yes, I think so; there is no difficulty.

707. It could be done with three very flat arches, without changing other ative circumstances?—Yes.

708. Sir *John Shelley*.] Do you agree with what Mr. Hawkshaw said as to settlement in these piers, that there would be no settlement at all?—They would not settle.

James Simpson, Esq., called in; and further Examined.

J. Simpson, Esq.

709. *Chairman*.] HAVING heard the evidence which has been given before the Committee, is there any point upon which you wish to make any observations?—I think not, except to say that both Mr. Rendel and myself have considered the question of having cofferdams, and that it might be done; but that it would be a question of time, as it would occupy five years; I have here a plan upon that point. (*The Witness produced the same, and exhibited it to the Committee*).

Vide Appendix, No. 1.

Mercurii, 23° *die Julii*, 1856.

MEMBERS PRESENT.

Mr. Henley.	Mr. Ker Seymer.
Sir Benjamin Hall.	Mr. Tite.
Mr. Bramston.	Sir John Shelley.

THE RIGHT HON. JOSEPH WARNER HENLEY, IN THE CHAIR.

Thomas Page, Esq., called in; and further Examined.

T. Page, Esq.

23 July 1856.

710. *Chairman*.] IN the Appendix to the written paper which you have put in, at page 96, you have set out a letter at length, dated 16th January 1856, which is referred to in your written statement at page 79. It is as follows: "I am directed by the Chief Commissioner of Her Majesty's Works, &c., to inform you that he has considered it advisable to have the works of Westminster Bridge examined by some eminent engineers. He has, therefore, directed Mr. Rendel and Mr. Simpson to visit the structure, and to report to him fully upon all points in relation to the contract, the nature of the works, and all matters relating thereto, and to advise as to future proceedings. I have, therefore,

Vide Appendix, No. 2.

T. Page, Esq.

23 July 1856.

therefore, to request that you will put yourself in communication with those gentlemen, and afford them all the information and assistance you can in the prosecution of their inquiry." Having received that letter, did you receive any information either from the Chief Commissioner of Works or from Messrs. Rendel and Simpson, to lead you to know that the inquiry was to go into matters beyond those in connexion with the contract, and to inquire, in fact, into the proposed mode of building the bridge?—From Mr. Simpson I understood that the principal reference was upon the contract, but points of construction were also mentioned generally.

711. You understood through Messrs. Rendel and Simpson that their inquiry was not to be confined to the questions arising out of the contract, but was also to be extended to the nature of the construction?—That it was principally upon the contract, but that they were to inquire into the matter generally.

712. Was any communication made to you by any other parties, except Messrs. Rendel and Simpson?—I do not recollect any other communication. All that Mr. Rendel and Mr. Simpson went into, until their instructions on the 31st of March, was upon points relating to the contract.

Vide Appendix, No. 2.

713. In page 102 of the Appendix, I find a letter from yourself to the First Commissioner of Works, dated 19th May 1856, in these terms: "Sir, I have received communications from Mr. Rendel and Mr. Simpson, relative to the contract drawings of Westminster Bridge, and the levels of the approaches, from which I conclude they are to report to you upon other matters than the contract with Mr. Mare. I would therefore suggest that I should be furnished with copies of any instructions to those gentlemen, and with any observations from you upon those points on which you may wish for information. I have lent to Mr. Rendel and Mr. Simpson the contract drawings, and given them the levels of the approaches, and have requested them to state what further information they may require; and on my return from Edinburgh, whither I am going relative to the Chelsea Bridge, I will again confer with them if necessary." Before that time, or afterwards, did Messrs. Rendel and Simpson communicate to you the formal written instructions which they had received from the Board of Works at the end of March?—After failing to obtain any copy of the written instructions from the department, I wrote to Messrs. Rendel and Simpson, to ask them for a copy of the instructions, as I did not conceive that they would enter upon the inquiry on instructions which were not open, which were in a manner secret from me. Mr. Rendel, or rather Mr. Simpson, in a private manner allowed me to see a copy of the instructions, from which I made an extract, or had an extract made.

714. Had you seen or known the nature of the instructions from either Mr. Rendel or Mr. Simpson, antecedently to the 19th of May, when you addressed this letter to the Board of Works?—No, and I considered that the communication afterwards made to me by Mr. Simpson was a private communication, and that I was not justified in making use of it. It was given me for my own information. I do not consider that I could have stated that I had received, or seen the instructions to Mr. Rendel and Mr. Simpson, without violating confidence between them and me.

715. Was the communication of the instructions which was made to you by Mr. Rendel or Mr. Simpson made in such a way that you considered it confidential, or did you consider that it was made to you by the order of the parties who had employed them?—I considered it a confidential communication, decidedly. If I had not so considered it I should have set it forth in my statement. I considered it an act of kindness in Mr. Rendel and Mr. Simpson to allow me to see the instructions, when I could not obtain them from the department.

716. Before the time when you made this application to the Board of Works on the 19th of May had you understood from the former communications from the Office of Works or from the communications made to you by Messrs. Rendel and Simpson, that the inquiry was to be of the extensive nature with regard to the structure which it turned out to be?—Certainly not. Mr. Simpson mentioned to me that he believed they would have to inquire into the "whole thing," but I had no idea that it would go to the extent which it did. The suggestions which they made to me upon the works were, that the foundations would be better done under my own superintendence until the piers were brought up to two feet above low water, so that a contract might be taken without risk,

T. Page, Esq.

23 July 1856.

risk, as it were, on the part of the contractor; and I had so little idea of any suggestion from them as to a total change in the foundations, that in consequence of Mr. Rendel's suggestion, I saw and wrote to Mr. Cochrane of Woodside on the 19th June, to know if he would undertake, for a lump sum, and in a fixed time, to complete the works, which Mr. Rendel said might get over the difficulty.

717. Sir *John Shelley*.] Does that letter appear in your paper?—It does not, but I am stating this to show that I had no idea that the inquiry of Messrs. Rendel and Simpson would go to any extent beyond the nature of the works.

718. *Chairman*.] If I understand your answer, you say that you understood from the nature of the communications made to you by Messrs. Rendel and Simpson, that their inquiry would rather tend to a mode of change in carrying out the then proposed work, than to any alteration of the scheme altogether?—Exactly so; I was not aware that anything had been said against the scheme or the mode of executing it.

719. But you thought from the communication made to you, that the work would be better executed under your own superintendence, than by putting it to contract?—Yes, up to two feet above low water; and I looked upon their suggestions to me as made in a friendly way.

720. Whether you drew a correct inference from what they said or not, that was the inference which came to your mind?—It was so, decidedly.

Vide Appendix, No. 2.

721. Mr. *Tite*.] I should like to call your attention to page 79 of your Statement, paragraph 5: "Except this letter," which is the letter of the 16th of January, to which the Right honourable Chairman referred, "I had no information as to the object of Messrs. Rendel and Simpson's inquiry, and I concluded that it was limited to matters connected with the contract." Do you desire to qualify that sentence?—"No information from the department" would be better.

722. What qualification do you desire to insert in it?—"From the department." It stands in one of the corrected copies, "from the department," and I do not know how that has been omitted here.

723. What correction do you desire to make in that sentence, because it appears to me inconsistent with your evidence?—"No information from the department," will be a sufficient qualification. I will show the Chairman a copy of my memorandum, with those words in; I looked upon my communications with Mr. Rendel and Mr. Simpson as private communications between ourselves; and more especially they would appear to be private communications after the Chief Commissioner had declined to furnish me with a copy of his instructions to them.

724. Sir *John Shelley*.] When were you refused, you say, "failing to obtain a written copy"?—On the 19th of May 1856; I wish that the Committee should have a thorough knowledge of my own proceedings and my own views.

725. Mr. *Tite*.] Is the alteration in that sentence to which I have drawn your attention, "I had no information from the office," or, "from the department"?—"From the department."

726. You say, "I concluded that it was limited to matters connected with the contract;" as you had information other than that, though confidential, the conclusion is scarcely a fair one, is it?—Until the second instructions to Mr. Rendel and Mr. Simpson had been issued, all they proceeded with was upon matters relating to the contract.

727. Were there two sets of instructions then to Messrs. Rendel and Simpson?—Yes, there were two sets of instructions, because the Chief Commissioner, in his letter to the Lords of the Treasury of the 23d of February, which I believe has been given in evidence by Mr. Austin, stated "that he had received the report of Messrs. Rendel and Simpson on the whole of the matter referred to *them*;" you have the evidence here, you will see those expressions used, "on the whole of the matter referred to them;" the second instructions I think mentioned especially what they are to do; they are to go into the details of the plan, and should their opinion be unfavourable to the prosecution of the present plan, they are then to set forth most fully the grounds on which they come to that conclusion; therefore the instructions themselves, setting aside any private communication made by Mr. Rendel and Mr. Simpson, seem to me clear upon that point, that the first report was upon the contract, and that the second instructions and report were upon the plan.

728. I wish

728. I wish you would confine your attention to this sentence, and see how you would like to have it modified; it still appears to me, in justice to yourself, as well as in justice to the department, to require some consideration?—Then I should say, "it principally related to matters connected with the contract," instead of saying "it was limited."

729. Will you be good enough now to suggest any modification which occurs to you?—I should say then, "that it principally related to matters connected with the contract." All I can say is, that I had no idea it was of that full nature which it appears to have been.

730. And that no communication, whether confidential or otherwise, led you to another conclusion?—Mr. Simpson stated that they were to inquire into the "whole thing," but that I concluded was the nature of the works.

731. When did they state that?—Before they first visited the works.

732. Sir *John Shelley*.] When was that?—I do not recollect the date, but it was after their first instructions that they visited the works.

733. After they had made their first report?—No, before they made their first report.

734. Was it soon after the letter of the 16th of January?—I believe it was; I cannot state precisely.

735. That is early in the proceeding, is it not?—Yes.

736. Soon after the 16th of January?—I know it was before they made any report upon the contract.

737. As a matter of fact, whether you considered it confidential or not on the part of Messrs. Rendel and Simpson, did you or did you not receive from them soon afterwards information that they thought that their duty would be to look into further matters than the mere question of the contract?—It was merely an observation of Mr. Simpson's that they were to look out the matter generally.

738. What made you think that that was entirely a private and confidential and friendly communication on their part?—I looked upon any information from them which went beyond the communication from the department to me as a private communication.

739. But you looked upon them as having been appointed to do certain things by the department?—Yes.

740. Therefore they were officially employed, were they not?—Yes. For instance, in allowing me to see a copy of their instructions of the 31st of March, that was a private communication.

741. Are you aware whether they had had any orders from the department either to show you or not to show you any instructions which they had?—No, I am not aware of what they were expected to do.

742. Then you cannot say that in showing you those instructions they may not have been acting according to the orders which they had from the Chief Commissioner; you are not able to say that they were going beyond their instructions from him, are you?—I cannot say positively; only I so concluded.

743. Why did you think that they were going beyond the instructions which they had received from the office?—Because if they thought that they were not going beyond those instructions, they would have answered my letter, and sent a copy of the instructions, instead of allowing me to see them.

744. Which letter do you refer to?—No published letter; it is a letter to Mr. Rendel and Mr. Simpson.

745. Did you write any letter to the office?—Yes.

746. Which letter is that; I see you say "failing to obtain a written copy"?—The letter of the 19th of May, at page 102.

Vide Appendix, No. 2.

747. The answer to that letter you have put in, and that answer is this: "I am directed by the First Commissioner of Her Majesty's Works, &c., to acknowledge the receipt of your letter of this date on the subject of Westminster Bridge, and to inform you that Messrs. Rendel and Simpson have been instructed to report their views upon all points in relation to that bridge, and that they will, of course, communicate with you on the subject, if they should desire information"?—Just so.

748. When they did communicate with you on the subject, what made you think that they were going beyond their instructions, and that it was merely a friendly and private communication?—I communicated with them, and asked them for a copy of the instructions, after failing to obtain them from the depart-

T. Page, Esq.

23 July 1856.

ment; and if they had acted as though it were a public matter, they would have replied to my letter, and sent me a copy of the instructions.

749. *Chairman.*] If I understand you, you consider the communication to have been private, because the office declined to furnish you with a copy of the instructions?—Yes, and because Mr. Rendel and Mr. Simpson did not send the instructions in answer to my letter.

750. Sir *John Shelley.*] I want to know exactly where the letter is which you wrote to the department, asking for a written copy of the instructions to Messrs. Rendel and Simpson?—It is at page 102.

Vide Appendix, No. 2.

751. That is not until May?—No.

752. Did you write to Messrs. Rendel and Simpson a formal letter, asking them for a copy of those instructions which they had received?—Yes, after that.

753. Where is the letter in reply, refusing to give it?—Of the 13th of May; I had no letter from Mr. Simpson refusing to give me the instructions.

754. I understood you to say "failing to obtain a written copy;" and you stated that you failed to obtain it from Messrs. Rendel and Simpson?—No; I failed to obtain it from the department.

755. Did you or did you not receive it from Messrs. Rendel and Simpson?—I saw the instructions, and had an extract from them.

756. What I ask again is, when Messrs. Rendel and Simpson gave you a copy of those instructions from which you took an extract, did you consider that they were doing that in a friendly and confidential manner, and without instructions or against the orders of the department?—Certainly; I know it was considered that they had no authority to give them.

757. What brought you to that conclusion?—Because when I wrote for the instructions they were not sent to me in answer to my letter.

758. I wish you to be particular as to dates; you say that it was on the 19th of May that you applied to the department; that is the date of the letter; what is the date of the application which you made in writing to Messrs. Rendel and Simpson for those instructions?—It was after that date.

759. About when?—I state on the 13th of May, "I have received your letter requesting me to send you the working drawings of Westminster Bridge, and also the section showing the finished line of roadway and levels of the door-steps between Parliament-street and Pedler's Acre. By reference to sections sent some years ago to the Board of Works the last-named document can be supplied, and both it and the tracings of the working drawings shall be put in hand for you."

760. That is previous to the 19th of May?—That is on the 13th of May.

761. *Chairman.*] Does that letter refer to the instructions?—It does. The letter proceeds thus: "Beyond a communication stating a general reference to you by Sir Benjamin Hall I have no information upon the object of your present inquiries, some of which do not appertain to the contract, but on these points I will communicate with the Chief Commissioner."

762. Sir *John Shelley.*] Is that a letter by you to Messrs. Rendel and Simpson?—Yes.

763. Is that the commencement of the correspondence?—Upon the instructions.

764. That is previous to the 19th of May?—It is.

765. What was the reply to that letter?—There was no reply to it.

766. Was there a refusal on the part of Messrs. Rendel and Simpson to give you that which you seem to have wanted at that time, namely, a copy of the instructions?—No; there was no refusal, but there was no answer.

767. Was there an acquiescence?—I felt there might be some embarrassment about the instructions, and I called on Mr. Simpson after that letter. I first communicated with the department; then I had the answer given in the Appendix.

Vide Appendix, No. 2.

768. At what date was that?—The 19th of May.

769. This letter from you to Messrs. Rendel and Simpson was on the 13th?—Yes; then I communicated with the department on the 19th, as I stated in my letter to Mr. Rendel and Mr. Simpson that I would communicate with the Chief Commissioner; then I received Mr. Austin's letter to say that if Mr. Rendel and Mr. Simpson wished for information, they would communicate with me; but it was not they who wished for information, it was I who wished for information, that is to say, a copy of the instructions, and I then called on Mr. Simpson to obtain some explanation.

770. When

770. When was that?—I do not recollect the date.

771. Before or after the 19th of May?—After the 19th of May.

772. After you received this letter from Mr. Austin the secretary?—Yes. Mr. Simpson let me have an extract from the instructions after I could not get them from the office.

773. You consider this letter of the 19th of May, signed by the secretary, as being a refusal to give you the instructions to Messrs. Rendel and Simpson?—I do.

774. What part of that letter do you consider as a refusal of that sort; do you consider your receiving the instructions through Messrs. Rendel and Simpson instead of direct from the department as not receiving them?—I consider that receiving them from Messrs. Rendel and Simpson is a private communication; and I consider that Mr. Austin's letter declining to send me the instructions which I asked for obliged me to obtain them from Mr. Rendel and Mr. Simpson, in an indirect manner.

775. Is not this an answer to your request. The secretary says that he is directed "to acknowledge the receipt of your letter on the subject of Westminster Bridge, and to inform you that Messrs. Rendel and Simpson have been instructed to report their views upon all points in relation to that bridge." Is not that telling you that they were instructed to report upon all points in relation to the bridge, and would not the works of construction come in with regard to "all points in relation to the bridge"?—Yes, in general terms; but what was due to me and what I required was a copy of the instructions to Mr. Rendel and Mr. Simpson.

776. That you ask for; and the office inform you that they were to report their views upon all points in relation to that bridge, and then say that they will communicate with you if they should desire information?—Yes, but the office does not send me that which I ask for.

777. You do not consider that it was a formal and an official communication to you, because it was made through Messrs. Rendel and Simpson?—I know that it was not official, and I considered it as a private communication. I considered that it was due to me that a copy of the instructions should be sent to me. Failing to obtain them from the department, I was driven to obtain them in an indirect way; it was a course which I was obliged to take, and which I did not like; and there is a letter of mine to Mr. Rendel and Mr. Simpson, in which I express my views upon it; so that they clearly understood from me in what light I received these instructions.

778. Then, although in an informal manner, you took an extract from the instructions?—Mr. Simpson gave me an extract from the instructions.

779. But you actually did take that extract: when was that?—I do not recollect the date.

780. About when; soon after the 19th of May?—Very soon after.

781. Within a few days after?—Within a few days, I have no doubt.

782. Sir *Benjamin Hall.*] On the 16th of January you received a letter, in which Mr. Austin stated that the First Commissioner of Her Majesty's Works had considered it advisable to have the works of the bridge examined by some eminent engineers; and that he had directed Mr. Rendel and Mr. Simpson to visit the structure, and to report to him fully upon all points in relation to the contract, the nature of the works, and all matters relating thereto, and to advise as to future proceedings; and you were requested to put yourself in communication with those gentlemen, and afford them all the information and assistance you could in the prosecution of their inquiry. I believe you received that letter?—Yes.

783. Did you not, very soon after the receipt of that letter, meet Messrs. Rendel and Simpson at the works?—I did.

784. Did they not enter with you into the nature of the structural works, and the principle upon which the bridge was built?—I explained to them the whole operations.

785. Did they not give you to understand that they were directed to inquire into the structure as well as other matters?—Mr. Simpson had given me to understand that they were to inquire generally into the Bridge, but I was not aware with reference to any change in the foundations.

786. But did they not go into the question of the piling, and into the nature of the structure below high water mark?—I explained everything to them as I

T. Page, Esq.

23 July 1856.

would explain it to any engineer coming upon the works. I did not wait for inquiries.

787. Did they not make inquiry as to the nature of the foundations, and as to the nature of the piling, and the works which formed the foundation of the bridge?—They made general inquiries, and I have stated what they suggested. They could not report on the contract without understanding the nature of the works.

788. Then why were you led to suppose that their inquiry was only to extend to the contract, or mainly to the contract, if they made minute inquiries as to the structure of the bridge, and especially the foundations?—They did not make minute inquiries and the communications afterwards with them were principally with relation to the contract.

789. That was after they had made their inquiries with relation to the structure?—It was after they had visited the works.

790. Did you believe, when they inquired into the nature of the structure, and into the foundations of that fabric, that they were limited at all in their inquiry as to the principle of the structure of the bridge?—I had no intimation that they were limited in their inquiry, because the nature of the works was named in the official letter.

791. Did you not believe, after you received that letter of the 16th January, and after Messrs. Rendel and Simpson made these minute inquiries as to the structure of the work, that they were to inquire into the nature of that structure, and to report to the First Commissioner accordingly?—I believed that they were to inquire into the nature of the works: but their inquiries to me upon the structure were principally after their second instructions in March.

792. You say that their principal inquiries as to the structure were after the second instructions, which were given to them in March?—Yes.

793. Did they not immediately after the 16th of January, when they first met you on the site of the works, make most minute inquiries as to the nature of the structure, and as to the foundations of the structure?—They made general inquiries upon those points, without which they could not form a correct notion of the contract.

794. *Chairman.*] I understood from one of the answers which you made to the questions just put to you, that when those minute inquiries were made after the first instructions in January, when the works were visited by Messrs. Rendel and Simpson, the suggestions made to you upon them were more as to the mode of carrying it out than as indicating any condemnation of the mode of structure?—Certainly. It was necessary that they should understand the position of the works, of the foundations, before they could make any report as to the contract.

795. Did anything pass before March between you and Messrs. Rendel and Simpson, or between you and any persons in the office officially, which led you to have any knowledge that the principle of the structure was to be called in question?—No, not at all. I had no idea that the principle of the structure was to be called in question.

796. With reference to the paper which you have put in generally, when you speak of being without information upon points, are the Committee to understand that that is to be confined to the want of official information?—Yes, the want of official information.

797. That though you might have obtained knowledge of the matters from other sources, those observations of yours are meant to be confined to the absence of official information?—Yes, I considered the other communications with Mr. Rendel and Mr. Simpson as private.

798. I also understand you to say, that you considered that in your position as architect to a great work, it was due to you that any matters of this kind, such as instructions to inquire into the general character of the work, should, as a matter of etiquette and propriety, have been communicated to you officially?—Certainly I did so; I considered that the manner in which I was treated, as the engineer to the department, was not short of being insulting. I have not here a copy of a letter which I wrote to Mr. Rendel and Mr. Simpson, but I shall have to put it in, because it will show the Committee in what light I regarded the communication with them.

799. Sir *John Shelley.*] What is the date of that letter which you say you wish to put in?—I cannot say precisely, because Mr. Simpson has it.

800. Mr.

800. Mr. *Tite.*] About when?—It was after Mr. Simpson let me have the extract from the instructions. *T. Page, Esq.*

23 July 185

801. *Chairman.*] Then it would be after the 15th of May?—After the 19th of May.

802. Sir *John Shelley.*] You say that soon after the 16th of January, when Messrs. Rendel and Simpson came to the works, they made considerable and minute inquiries into the principle of construction?—No, they made general inquiries; they made such inquiries as every engineer would make who visited the works, and I wrote a note to them on the pressure on the foundations.

803. What was your understanding of their object in making the inquiries as to the model and plan of the structure?—That they made the inquiries principally with reference to the contract; but Mr. Simpson said to me previously, "Sir Benjamin wants us to report upon the whole thing," which, as I understood, was the nature of the works, as named in the official letter. That was soon after the 16th of January?—Yes.

805. Between the 16th of January and the 19th of May was there any communication from you to the department requiring information?—No, I do not think I wrote to the department about those instructions; I wrote to the department on the 19th, after I received a letter from Mr. Rendel and Mr. Simpson, asking for the contract drawings.

806. Between the 16th of January and the 19th of May you did not write to the department?—No, I did not write to the department.

807. Mr. *Tite.*] Did you apply without writing to the secretary?—For any copy of the instructions?

808. Yes?—No, I did not, for I considered they related principally to the contract.

809. *Chairman.*] Had you any reason to believe before you made the application on the 19th of May, that the inquiry which was then going on by Messrs. Rendel and Simpson involved the nature of the structure and the desirability of proceeding with it?—As to the best mode of proceeding with it.

810. Not as to the mode of proceeding with it, but as to the question whether it was desirable to proceed with the bridge upon that construction or not?—No, I had no idea that the construction was questionable.

811. You had not any reason to believe that, before you made the application on the 19th of May?—No; soon as the contract drawings were sent for, then it was evident that the structure was to be specially inquired into.

812. That opened your eyes to the full nature of the inquiry which was going on?—It did.

813. And whether you had or not good reason before to know it, in point of fact and truth you did not, until those drawings were sent for, realise the nature of the inquiry which was being made?—No, I did not; as to my statement, perhaps it would require some modification to express my views more clearly; the little time that I have had has obliged me to have a great part of it written I may say in haste; and as I told the Chief Commissioner, who reminded me that there were omissions, I should wish to put this statement in such a way that it would really express my views.

James Meadows Rendel, Esq., and *James Simpson*, Esq., called in; and further Examined.

814. Sir *Benjamin Hall.*] (To Mr. *Rendel.*) DO you remember receiving a letter from me which was written on the 7th of January, in which I expressed a desire to see you on a matter of business?—I do; a short note. *J. M. Rendel*, Esq., and *J. Simpson*, Esq.

815. And you visited upon me on the 8th of January, I believe?—I think it was the 8th; I have not the note, but that was about the period.

816. I stated to you at that time that I had some apprehensions as to the nature of the structure of Westminster Bridge, and that I requested to have your professional advice and assistance in relation to that structure?—You did; I think you said that you had received information which made you anxious about the structural arrangements of the bridge.

817. I stated, I believe, that I had received information the very morning on which I wrote to you?—I think you did.

818. I then stated to you that I considered it a matter of very serious importance; that the structure of the bridge had been to a certain extent con-

J. M. Rendel, Esq., and *J. Simpson*, Esq.

23 July 1856.

sidered by a Committee of the House of Commons; that I did not wish to throw the whole responsibility of advising the First Commissioner on yourself, and that I thought it would be advisable that you should have some other eminent engineer associated with you in the duties which I was anxious that you should undertake, and I suggested Mr. Simpson?—You did; I hesitated whether I would undertake the business, and you then suggested that there should be two, and named Mr. Simpson.

819. I saw Mr. Simpson and yourself, once or twice, I believe, previously to the 16th of January?—I believe you did; Mr. Simpson, I believe, has more papers with him than I have, for I had no idea that I should be asked any questions of this nature.

820. I stated to you that I should write to Mr. Page to the effect which is contained in the letter of the 16th of January, and I instructed Mr. Simpson and yourself to meet Mr. Page?—You did; we stated that it would be necessary to be put in communication with Mr. Page.

821. You considered that the way in which that letter was drawn was to throw open the whole question as to the nature of the structure and the principle of that structure?—What I understood from our first interview, and from the letter which we afterwards received, was this, that you required us to advise you first as to what should be done with reference to Mr. Mare's contract; and secondly, after we had advised you upon the first point, to report on the structural arrangements. That was my understanding.

822. Did you meet Mr. Page upon the site of the works soon after the 16th of January?—I cannot recollect the day, but we got an appointment with Mr. Page, and we met upon the works very shortly I believe after I saw you; about the 11th of January I think it was; we got a note from Mr. Page, dated the 11th of January, in which he speaks of an arrangement for meeting us.

823. What does he speak of there?—He says, "Should I not call on you before, I shall be disengaged at half-past three, and will be glad to see you." That is to Mr. Simpson.

824. That was on the 11th of January?—Yes.

825. Then there must be a mistake, because I never saw Mr. Simpson until after that time?—(Mr. *Page*.) I can explain that. It was from Mr. Rendel and Mr. Simpson that I first learned that any inquiry was to take place. Mr. Rendel and Mr. Simpson told me that they had stated to the First Commissioner that they must be put into communication with me. That will explain the matter.

826. (To Mr. *Rendel*.) On the 16th of January a communication was made to Mr. Page, and after the 16th of January you met Mr. Page upon the works?—We did.

827. What took place when you met Mr. Page?—We went over the entire works with Mr. Page, and made inquiries as to all the details of construction, and from that period put ourselves into communication with Mr. Page, asking for particulars with reference to all the details of construction, and we received drawings and two rather long letters from Mr. Page, explanatory of such details.

828. Did anything at all pass, directly or indirectly, in the department, with any officer of the department, from which it might be inferred that any instruction which you received was to be of a private nature as regarded Mr. Page?—Certainly not; and when we received your full and complete instructions, dated the 31st of March, Mr. Simpson called on me to know whether there would be any objection to Mr. Page having a copy of those instructions, and, as I understood Mr. Simpson (it was between Mr. Simpson and Mr. Page), he gave Mr. Page, upon his application, a copy of the whole letter of instructions excepting the heading, which had nothing to do with the matter. The heading is this, "I am directed by the First Commissioner of Her Majesty's Works, &c., to inform you, in reference to your letters of the 11th and 17th instant, that acting under your advice he has placed the final settlement of the question between the assignees of Messrs. Mare and this Board, respecting the works and materials at the New Westminster Bridge, into the hands of Mr. Stephenson, in the terms set forth in a letter addressed by me to him on the 18th instant, a copy of which is herewith sent you, the assignees having approved of that gentleman as the referee." All the letter, with that exception as I understand from Mr. Simpson, he communicated to Mr. Page.

829. And

J. M. Rendel, Esq. and *J. Simpson*, Esq.

23 July 1856.

829. And that letter is in relation to the proceedings with the assignees rather than in relation to the structure?—No; all excepting the first paragraph has relation to the structure, and not to the contract with Messrs. Mare.

830. *Chairman.*] Do you know the date when Mr. Simpson communicated those instructions to Mr. Page?—I do not; but Mr. Simpson will be able to tell you, and he thinks that it was some time in May.

831. Probably after the application to the office?—That I cannot tell you; I was not aware of any of the circumstances. When Mr. Simpson named the matter, it appeared to me to be very natural, and needed no consideration.

832. Sir *Benjamin Hall.*] (To Mr. *Simpson.*) You have heard what Mr. Rendel has said with regard to any secrecy or privacy in the matter; do you concur in what he has said?—Yes.

833. Did you consider at all that you were prohibited from communicating with Mr. Page fully upon the subject?—No; we had no direct orders to communicate, in fact, no orders at all, further than the general business of communication; and without communicating with Mr. Rendel, I hesitated to give Mr. Page a copy of the orders; but after I had seen Mr. Rendel, and he had concurred with me that it would be proper to show Mr. Page the orders, I placed them before him, with the understanding that we had no authority from the office upon the subject. I said, "You may make extracts if you please." We were then conversing about the bridge, and I thought it was giving him trouble, and I desired the clerk to make a copy and let him have it.

834. I believe your general instructions from the office were, that you were to put yourself into communication with Mr. Page upon all matters in relation to the bridge?—Decidedly.

835. (To Mr. *Rendel.*) Will you state to the Committee whether, when you visited the works with Mr. Page, you made inquiry as to the nature of the structure, and the principle of the structure?—Clearly so; Mr. Page has not said that we did not. It is quite true that, going over those works with Mr. Page, I said to Mr. Page, "If I had to be responsible for these foundation works, complicated as they are, I never would allow them to be let by contract. It is necessary in carrying out works of this description that the engineer should have unlimited control over every man employed in their execution." Mr. Page will remember it; and I said, "If I was the engineer to be responsible, the driving of these cast-iron piles is a work I would not allow any contractor to execute; I would execute it myself; any error, any breakage of these iron piles would be so serious a matter, that it is a description of work which ought not to be entrusted to a contractor." I went into the matter very fully with Mr. Page, and especially with reference to the difficulties of executing a work of this kind.

836. *Chairman.*] That was advice given when you were going over the works with Mr. Page, as to their future prosecution, assuming that they were to be prosecuted?—It was advice given upon the whole question of the works as then executing, as a matter of principle. The principle which I objected to was, that works done in the tideway, where they could not be seen, and where no engineer could thoroughly trust to works being soundly carried out by the workmen of a contractor, should be executed by contract at all, and I quoted a case in our London Docks. Mr. Page will recollect that I said, "I have had so much trouble even with the best contractors in the construction of such works in the open tideway, that I would not allow a contractor to construct even an ordinary coffer-dam wanted for the new works. I executed it under my own personal direction, as the only mode of making myself responsible."

837. Will you tell us whether the instructions written on the 31st of March, which you received from the office, were or were not more extensive than those instructions which you received at the commencement of January?—They were; I felt that the business to be inquired into was of that comprehensive kind, that, with Mr. Simpson, I requested the explicit and direct instructions; such instructions we considered to be furnished in the letter dated the 31st of March.

838. You having received instructions less explicit in the commencement of January, inspected the works, and found things in such a state that you wished for explicit instructions as to the course of your future proceedings and report?—Distinctly so. I felt that any report which we could make, except upon explicit instructions, would be unsatisfactory to ourselves, and could not be satisfactory to the department which employed us.

J. M. Rendel, Esq., and *J. Simpson*, Esq.

23 July 1856.

839. You have stated, in answer to the questions of the Chief Commissioner, that you considered that your first instructions were with reference to the matter of the contract, and, secondly, as to the further prosecution of the works; when you used the term "further prosecution of the works," did you mean further prosecution of the works upon that plan then in progress, or upon any other plan?—Upon the plan then in progress. I tried to divide what I understood to be my instructions, or rather our instructions, in this way; we were first to inquire into what was expedient to be done with reference to certain demands made upon the department by the contractors, which had reference therefore to dealing with the question of claims by the contractors, and, secondly, with reference to the structure itself.

840. Then anything which would pass between you and Mr. Page during that time would not naturally lead him to think that the inquiry was instituted with reference to the sufficiency of the plan, or an abandonment of the plan altogether?—Most naturally.

841. Would it necessarily?—I think not necessarily.

842. In consequence of those inquiries, you have stated that you yourself, and Mr. Simpson, required that more explicit instructions should be given to you, which were given upon the 31st of March; did you communicate, or was any communication, direct or indirect, with your knowledge, made to Mr. Page, that you were seeking those more explicit instructions?—I am not aware.

843. Having received those more explicit instructions, they do necessarily involve an inquiry as to the future prosecution of the then plan?—They do.

844. We have understood from other evidence which has been given, that from some request upon your part and Mr. Simpson's, as to some drawings, Mr. Page made application to the Board of Works for a copy of those explicit instructions which he had not then received, and Mr. Simpson confirms the statement which you have made as to his being furnished with a copy of a part of those instructions through you?—Yes; the whole instructions, with the exception of the first paragraph, which regarded advice Mr. Simpson and myself had given the department as to the mode of settling the disputes with the late contractors.

845. Did anything pass between the end of March and the middle of May which would lead you to the belief that, either directly or indirectly, the substance of those further explicit instructions was known to Mr. Page?—I know of nothing. Mr Page communicated more with Mr. Simpson than with myself; but when Mr. Simpson communicated with me, we always agreed that whatever information we had, or whatever directions we had, ought to be at Mr. Page's disposal.

846. (*To Mr. Simpson.*) From any communication or otherwise which passed between Mr. Page and you, between the end of March and the middle of May, had you any reason to know or believe that Mr. Page was aware of the substance of those further explicit instructions?—Not in detail. We had communicated them in conversation from time to time, and until Mr. Page wrote requesting a copy I was not aware that he wished to have them.

847. But from the conversations which you say took place from time to time, had you reason to infer that he was aware of the extended nature of the inquiry which you were then entrusted to make?—Yes, I thought he was.—(Mr. *Rendel.*) Really, Sir, I feel it due to myself to say that I should no more have thought of acting on instructions I was not to communicate to the professional man whose works I was investigating, than I should have thought of flying; and had Mr. Page asked me any questions, or stated that there was any information which he could not get direct, I should have felt it my duty at once to have said to the office, If you do not supply Mr. Page with this information, I must think the opposite course would have been so unprofessional and would have been, so unjustifiable, that no honourable man would have conducted the business in such a manner.

848. I will put this further question, which I think is due both to yourself and to Mr. Page; should you not, as an ordinary matter of business, suppose that explicit instructions of that nature, given to you and Mr. Simpson, would naturally have been communicated to Mr. Page by the office?—I should have thought that the office would have communicated with Mr. Page, to have given the fullest information necessary to enable the professional men employed to investigate the points submitted to them.

849. And

849. And that the point which was being investigated would have been clearly brought to his knowledge, he being the architect responsible for the work?—As I said before, I should have thought that there could have been no secrecy. It seems to me quite absurd to suppose that there was any secrecy in the matter of our investigation. I cannot understand it. When I heard the question put by the Committee, I was surprised. I had not the smallest idea of secrecy; and Mr. Page will say that I never conducted my communications with him, as though I was asking from him information which I was not to use officially.—(Mr. *Page*.) Certainly not.

850. (To Mr. *Rendel*.) Whatsoever may be the answer which has been given, everything which was done seems to have gone on with the most perfect confidence, nothing being withheld?—Mr. Page will tell you that we asked for information at various times as freely as professional men could ask for it, upon points which we thought material to the investigation entrusted to us; and Mr. Page as freely and as openly communicated information upon those points, always in writing and in an official form.

851. Sir *Benjamin Hall*.] I understand you that you had certain general instructions given you by the Office of Works in the month of January, or early in February, but soon after your interview with the First Commissioner?—Yes.

852. Then am I to understand that during the course of your investigation, and after your interviews with Mr. Page, you found that the matter was of so serious a character that you desired some detailed instructions as to the exact points upon which you were to report?—After consultation with Mr. Simpson I found the matter entrusted to us of that delicate nature that demanded the fullest instructions, so that we might report upon specific instructions.

853. Did you not inform Mr. Page that you were desired to make a full inquiry into the subject?—I should have been, in Mr. Page's position, as fully alive to the fact that the two engineers were investigating the whole question, as though I had had a volume before me upon the subject; because our communications with Mr. Page were, from the very earliest period, with reference to the details of construction. That is marked by a note from Mr. Page to me, of the 29th of January 1856, in which he says: "I send the tracings which you wished for, showing the section of the river, with the position of the caissons of the old bridge, and a horizontal and vertical section of one of the piers of the new bridge, the average depth of the bearing piles being 29 feet 6 inches below low-water line, equal to a depth of 21 feet below the general level of the old caissons. In my memorandum" (with which he afterwards kindly furnished us) "I shall show that the pressure on the ground under the sites of the old piers is six tons on the foot super, and the pressure on the ground under the surface of the new piers will be 2¼ tons per foot super; that the pressure on each pile at London Bridge is, according to the engravings, about 84 tons, and the pressure on each pile at Westminster New Bridge would be 14½ tons, supposing the weight borne altogether by the piles. I have not figured the drawings, as I would not delay them;" nor did he.

854. Did you in any way whatever conceal from Mr. Page any instructions which you had had from the Department of Works in relation to your inquiry?—Most certainly not; I have said already that I would not have accepted the business upon such terms.

855. Mr. *Tite*.] Did you communicate to Mr. Page the difficulties that you yourself felt, upon which you have reported; I will take, for instance, one very grave and popular one, the difficulty of uniting the two halves of the bridge subsequently?—I am not aware that I went into that question; I asked Mr. Page very particularly upon the subject of how he would meet the difficulty, and he pointed out to me the driving of sheet piles across the foundation as the mode by which he proposed to carry it out. What I chiefly communicated with Mr. Page upon was the difficulty of driving those iron piles satisfactorily where they could not be seen, namely, below low water.

856. Sir *Benjamin Hall*.] Am I to understand that when you required those further instructions, which were of a more definite character, you did so solely for your own particular guidance, and for the guidance of Mr. Simpson, as to the course which you should take in reporting, and that it had nothing whatever to do with any communications which you had made to Mr. Page?—Certainly. The object which I had in view was this, that our report should

J. M. Rendel, Esq., and *J. Simpson*, Esq.

23 July 1856.

be intelligible, and that to make it intelligible it should have reference to direct instructions.

857. Mr. *Tite.*] You said something as to contract; did you mean that you thought that Mr. Page, by having contracted with an individual to do a work of that particular character for a lump sum of money, was placed at a disadvantage; did you mean that he ought to have had contract prices?—No; I meant that there should be no contract at all for the construction of piers of that description up to the level of low water; that above the level of low water the works could be supervised, and therefore might be eligibly contracted for; but that as regards the works below low water, where the engineer must of necessity have very great anxiety about their being properly executed, he should have the entire control, without the intervention of a contractor.

858. You do not know at all whether he was compelled or not to adopt any other course upon that subject?—No; I only mean to indicate what would have been my course in such a position.

859. Did you mean, in your answer to the Chairman's question, to suggest that you thought it would have been right for Mr. Page to have had a copy of the instructions which were given to you and to your friend from the office itself; does there seem to you to have been any irregularity in that particular or otherwise?—I should have said at once that the instructions should have been communicated to Mr. Page by ourselves, by the engineers; I cannot conceive secrecy in the matter at all; therefore one's mind can hardly be brought to answer such a question. The instructions, as far as I was concerned, might have been read at Charing Cross.

860. Sir *Benjamin Hall.*] Did you consider that those specific instructions were necessary in consequence of anything which had struck you more forcibly in relation to what you considered inefficiency in the structure, or did you merely desire them in order that you might be able to make a report specifically founded upon certain instructions which were addressed to you?—To make a report specifically founded upon certain instructions addressed to us.

861. Mr. *Tite.*] (To Mr. *Simpson.*) Mr. Page has stated that he did consider that he received from you those instructions in confidence; that you were good enough to give them to him?—It was so far in confidence that after communicating with Mr. Rendel we felt most strongly that he ought to have them. I did not, except on two or three occasions when Mr. Rendel was not in town, act without him, but we generally acted in concert and conferred together. In handing those instructions to Mr. Page, I gave him to understand that we had no authority, and that we had had no communication with the office upon the subject.

Thomas Page, Esq., called in; and further Examined.

T. Page, Esq.

Mr. *Page.*—I HAVE now found a copy of the letters which I mentioned, which throw some light upon this subject, upon my impressions. "Whitehall Yard, 2 June 1856. Dear Sirs,—I have applied to Sir Benjamin Hall for a copy of his instructions to you relative to Westminster Bridge, but he has not thought proper to comply with my request. I do not believe that either of you would undertake any inquiry which could not be conducted in the most fair and open manner, and I therefore ask of you to favour me with such extracts from the instructions as may apply to the works under my charge, and which may be useful in my answers to your questions which I am engaged upon in accordance with the terms of your letter of the 21st ultimo. Very truly yours, *Thomas Page.*—J. M. Rendel, Esq., James Simpson, Esq." Then the next is on the 16th of June, from myself to Mr. Simpson: "My dear Sir,—One part of my letter to Mr. Rendel and yourself, relative to the reference to Sir Benjamin Hall's instructions to you, I wish to draw your attention to. If I had omitted all mention of the instructions, the case would have stood thus, that I could obtain them neither from Sir Benjamin Hall nor yourselves, a position which you would not like should be assumed. I knew nothing of the views of Mr. Rendel and yourself, as to the use to be made of the reference to the instructions which you permitted; but of course I asked for them that I might see their bearing, and that I might quote them. If such quotation is in any way disagreeable to you, I shall be glad to

see

see you on the subject, as I should much regret any cause of annoyance in the matter. No honourable man could expect you to undertake an inquiry without making known the instructions; but it is on the best way of dealing with them that I wish to hear from you."

T. Page, Esq.

23 July 1856.

862. Mr. *Tite.*] Are you prepared with the modification in your statement which has been alluded to?—I am.

Vide Appendix.

863. *Chairman.*] Will you put the Paper in?—(*The Witness delivered in the same, as altered by himself.*)

Mr. *Simpson.*—Mr. Page wishes me to mention my impression of what, on our first instructions, our attention was directed to. It was directed at that time to matters in connexion with the contract necessarily; the difficulties then arising out of the contract; we were obliged to direct our attention to them, as well as to the works of construction; it was the question of settlement with Mr. Mare which was then principally oppressing the Chief Commissioner. The questions relative to the bridge and its construction had been submitted to us previously by Sir Benjamin Hall.

APPENDIX.

LIST OF APPENDIX.

Appendix, No. 1.

Letter from E. Tyrrell, Esq., to the Right Hon. Sir B. Hall, Bart., M.P. - - - - p. 77

Appendix, No. 2.

Observations by Mr. Page, in reply to the Report of Messrs. Rendel & Simpson, on the New Westminster Bridge, submitted to the Select Committee of the House of Commons 1850, on the New Westminster Bridge - - - - - - - - p. 77

Appendix, No. 3.

Statement in Answer to Question 655 - - - - - - - - p. 103

APPENDIX.

Appendix, No. 1.

Letter from *E. Tyrrell*, Esq., to the Right Hon. Sir B. Hall, Bart., M. P.

Sir, Guildhall, 17 July 1856. Appendix, No. 1.

I AM directed by the Navigation Committee of the Corporation of London, before whom I have laid the Reports and Plans of Messrs. Rendel and Simpson respecting the new Westminster Bridge and the proposed bridge at Lambeth, to state to you their opinion that any bridge built over the River Thames at Westminster with arches of a less height than 25 feet above Trinity high-water mark, will be injurious to the navigation of the River Thames; and that the piers of the arches of any such bridge should be built at such a depth as to allow dredging in the bed of the river in the vicinity of the bridge to the extent of 35 feet below the level of Trinity high-water mark, to improve the navigation of the River Thames.

The Committee trust that should any opportunity present itself in the alteration of the Plans for the new Westminster Bridge, as well as in the proposed bridge at Lambeth, the points before mentioned will receive due consideration.

I have, &c.

(signed) *E. Tyrrell*, Remembrancer.

Appendix, No. 2.

OBSERVATIONS by Mr. *Page*, in reply to the Report of Messrs. *Rendel & Simpson*, on the NEW WESTMINSTER BRIDGE, submitted to the Select Committee of the House of Commons 1856, on the New Westminster Bridge. Appendix, No. 2.

BEFORE proceeding to make my observations in reply to the Report of Messrs. Rendel & Simpson, it seems to me to be material that I should bring shortly under the notice of the Committee—first, the circumstances under which the erection of the Westminster Bridge were intrusted to me by Her Majesty's Board of Works; and next, the proceedings attending the suspension of the operations there, which have resulted in the present inquiry.

Committees of the House of Commons having at various periods inquired into the condition of Westminster Bridge, the practicability of maintaining it for traffic, and the expediency of constructing a new bridge upon the site of the old one, the Committee of the House of Commons of 1846 reported that, on the evidence which had been laid before them, a sufficient case had, in their opinion, been made out to justify them in recommending the removal of the present bridge, the construction of a new one upon the same site, and the transfer by Act of Parliament of the estates and property of the Bridge Commissioners to the Commissioners of Her Majesty's Woods and Works.

Again, in 1850, the Select Committee of that year were instructed "to consider and "report specially on the expediency of erecting a permanent bridge on or near the site of "the present bridge;" and this inquiry resulted in their recommending the erection, in case of need, of a temporary bridge across the river, and the institution, by Her Majesty's Government, of an inquiry for the purpose of ascertaining the most economical mode of building an improved bridge *on* or *near the present site.*

The Commissioners appointed by the Treasury on 20th May 1851, submitted to their Lordships the following recommendations, viz.:

"That the bridge should be used as a temporary bridge until the new bridge shall "have been constructed;

"That the new bridge should be constructed adjoining, or as near as possible to, "the present bridge, either on the north or the south side thereof;

"That

Appendix, No. 2.

"That it should not have more than five arches, which should be of iron, with stone piers;

"That the bridge should not be less than 60 feet in width, that it should have a headway at the centre arch of 25 feet 6 inches above the high-water standard, called 'Trinity Datum;' and,

"That no time should be lost in making preparations for the commencement of the work."

In conformity with these suggestions, Parliamentary plans were deposited under instructions given to Mr. Hardwick by Lord Seymour as Chief Commissioner, in 1851, and by Lord John Manners to Mr. Hardwick and myself in 1852, in both instances for a bridge to be erected on the present site. My designs, in 1852, were for a bridge of either three or five arches, as might be determined.

When, however, the designs came to be considered by Sir William Molesworth, in 1853, preparatory to being submitted to a Parliamentary Committee, it was recognised as a principle that the bridge, which was to abut upon the Houses of Parliament, should be so arranged as to occasion the smallest possible interference with the effect of those buildings, and it was thought due to Sir Charles Barry that the design, as far as architectural and ornamental character was involved, should be approved by him. As, however, the low levels of the streets leading to the bridge, and the great traffic which would pass over it, rendered it important to limit the elevation above high-water mark to the absolute requirements of the navigation, and to secure the attainment of an easy gradient, the number of arches in the approved design was increased to seven, and the spans of the arches and the thickness of the crown of each arch were reduced in proportion.

This arrangement involved the construction of two extra piers, and, of course, added to the difficulties of the work, but to secure a bridge which would not detract from the appearance of the Houses of Parliament was, in the opinion of the Chief Commissioner, worth the extra difficulties which it entailed.

In the construction of the new bridge, the width of which was to include the site of the old bridge, it was an important consideration not only to avoid the delay and expense of a temporary bridge, but to provide sufficient waterway for the navigation during the progress of the works by avoiding the use of coffer-dams. To this part of the subject Sir William Molesworth gave considerable attention, and when he had decided that the additional width required for the bridge should be set off on the upper or south side of the old bridge, I proposed to construct that part of the bridge first, and to open it for traffic before the main part of the old bridge should be disturbed, excepting those portions of its cutwaters and piers, the removal of which would be required for the foundations of the new piers, and I anticipated that by rapid progress with this part of the work, the first section of the bridge could be completed and opened without any serious detriment to the old structure.

In 1853 the Act passed for the erection of the bridge now in progress. Detailed plans of the mode of construction were not before the Select Committee on this Bill, but I fully explained my intention of erecting it without coffer-dams, and in separate sections, and Messrs. Hawkshaw and Fowler went fully into the subject in their evidence. On both these points the Committee were satisfied. The great points of inquiry before the Committee, however, were the amount of headway and the gradients of the bridge; and although on these points a strong opposition was made on the part of the City of London, by counsel and witnesses, including Mr. James Walker, Mr. Stephen Leach, and others, the principle of construction as then explained by me was not even attempted to be impugned.

On the 19th April 1854, the late Sir William Molesworth, First Commissioner of Her Majesty's Works and Public Buildings, brought under the consideration of the Lords of the Treasury the proceedings which he had thought it his duty to adopt, with a view to carrying into effect the intentions of Parliament in respect to the erection of a new bridge over the Thames at Westminster.

In this letter the reasons which led to the adoption of a headway of 20 feet, and of a bridge of *seven* arches instead of *five*, as recommended by the Treasury Commissioners in 1851, are fully detailed.

After very careful investigations, in which Sir Charles Barry was consulted in regard to the architectural features of the bridge, I completed my design, which was submitted by Sir William Molesworth to the Lords of Her Majesty's Treasury, and received their approval.

Working-drawings and specifications were then made out, the quantities ascertained, and advertisements for tenders issued.

My estimate amounted to 224,308 *l.*, including a sum of 10 per cent. for contingencies, which, with an addition for dredging and other works made a total of 235,000 *l.* The tender of Messrs. Mare and Co., which was for 206,438 *l.*, was accepted by the First Commissioner of Her Majesty's Works, &c., subject to the approval of the Lords of the Treasury, which was given on the 27th of April 1854, accompanied with authority to take immediate steps to carry the work into effect.

The works were commenced in May 1854, Messrs. Mare and Co. being under contract, with sufficient securities, to complete them by the 1st of June 1857. The severe winter of 1855, however, having occasioned a complete cessation of work for a considerable period, and some other unforeseen delays having arisen, I became satisfied that it would not be prudent to calculate upon the completion of the bridge before Midsummer 1858. On this subject I take leave to refer to my report to the Secretary of the Commissioners of Her Majesty's Works and Public Buildings, dated 18th June 1855, presented to the House of Commons, and ordered to be printed, 28th June 1855.

In

In August, 1855, Sir William Molesworth, who had devoted the most anxious and unwearied consideration to the whole questions connected with the bridge, was succeeded by Sir Benjamin Hall as First Commissioner of Works. Soon after this period rumours having reached me of the financial embarrassment of Messrs. Mare & Co., and the possibility of their becoming bankrupts, I brought these under the notice of the First Commissioner on 20th September last, and asked for instructions as to the course to be taken in case the works should be stopped. My instructions in reply, on the 25th September, were "to take such measures as might be practicable without violating the contract." The same day the contractors were rendered bankrupt, but the assignees stated that they did not wish to abandon the works, and they proceeded with them accordingly. As a critical part of the operations were then in progress, I thought it desirable to give them time to ascertain at what rate they could proceed before advising any stringent measures. This emergency was the source of great anxiety to me, and I of course made it my duty to ascertain in what way it could be met, supposing the assignees to be either unable or unwilling to carry on the contract. I found that Mr. Campbell, who throughout had charge of the works for Mr. Mare, was disposed to undertake to proceed with the works upon the terms, generally, of Mr. Mare's contract, under approved securities. I communicated this to the Secretary of the Board of Works in a letter upon the 27th September, and at the same time laid before him every fact which in my opinion was necessary to guide the Board in its decision how to proceed with the works without violating the contract.

To this letter no written answer was returned, but I had an interview with the First Commissioner on the subject a few days afterwards. On the 12th January I reported on certain bills for extras handed in by Mare's assignees, and stated at considerable length my opinion of what should be done to prevent embarrassment to the Department of Works, and to avoid delay in the execution of the work.

On the 15th of January this letter was acknowledged, and instructions were sent to me by the First Commissioner to prepare myself to give details as to arrangements with other parties for the completion of the works. On the 27th of February I reported the details of such an arrangement, and gave the names of responsible contractors, who were prepared to complete the works for a sum not exceeding my original estimate. These contractors were * Messrs. Cochrane, of Woodside, and I pointed out "that if fair arrangements could "be made with the assignees of Mr. Mare, it would be to the advantage of Government, "both in point of time and expense, to arrange with Messrs. Cochrane for the completion "of the work."

In the meantime, viz., *on the 16th of January*, the Chief Commissioner informed me that he had "directed Mr. Rendel and Mr. Simpson to visit the Bridge and to report to him "fully on all points in relation to the contract, the nature of the works, and all matters "relating thereto, and to advise as to future proceedings."

Except this letter, I had no information from the Department as to the object of Messrs. Rendel and Simpson's inquiry, and from what passed in my communications with these gentlemen, I conceived that it related chiefly to matters connected with the contract. In this conjecture I am born out by the letter of the First Commissioner to the Lords of the Treasury, of the 23d February last, laid before the Committee by Mr. Austin, in which he mentions, that he had that day received the report of Messrs. Rendel and Simpson, "on "the whole matter referred to them," and from the terms of the report itself, also produced by Mr. Austin.

On the 20th of March the works were stopped without any previous communication with me, and I immediately informed the First Commissioner of this fact.

The suddenness of this step took me completely by surprise, the more so that it was coupled with a communication from Mr. Campbell, the manager of Mr. Mare, that the First Commissioner had intimated to the assignees that the works might be discontinued at their convenience. It was of consequence to the security of the works, that they should not be suspended until further progress had been made, and I therefore wrote to Mr. Campbell, protesting against the sudden stoppage; and in a letter of the same date to the First Commissioner of Works informed him that I had so written, and stated my reasons.

From that time till now the works have remained suspended.

I beg to refer to the copies of the correspondence in the Appendix to these observations, which will place the Committee in possession of all the facts connected with the stoppage of the works.

It now appears from the evidence of the First Commissioner before the Committee (Ans. 449), that on the 7th of January he was "waited on by a gentleman in whose experience he "had great confidence; and who thought it would be better that he (the First Commissioner) "should direct his attention very particularly to the state of Westminster Bridge, which "he described not to be in a very satisfactory condition." Although the First Commissioner attached so much importance to the statement of his informant, that he considered it necessary instantly to call in the aid of Messrs. Rendel and Simpson, I was not made aware that any doubt existed either in regard to the principle of construction, or to the execution of the works; and until I read the statement of the First Commissioner I had no idea that any such charge had been made. As the engineer responsible both for the plan and the execution of the works, and as the engineering adviser of the Board of Works for more than 12 years, may I suggest that it was due to me that I should have been informed of

* *See* Messrs. Cochrane's letter, 19 February 1856.

Appendix, No. 2.

of an imputation so serious in its character having been made against me, and furnished with an immediate opportunity of vindicating my plans and my professional reputation? Instead of this, however, I was not even made aware by the department of the terms of the instructions given to Messrs. Rendel and Simpson until the report of these gentlemen had been printed for the House of Commons, and the present Committee had been appointed. The Committee is now aware, from the evidence of Mr. Robert Stephenson, Mr. Hawkshaw, and Mr. Fowler—all of whom have minutely inspected the works—that even after a sudden stoppage for four months, they are in a most satisfactory state. It may not, therefore, be thought out of place if I suggest that the informant of the First Commissioner should be called upon by the Committee to state the grounds upon which he cast his slanderous imputation upon my professional character. At however little I may rate any communication of such a nature, made in such a way, it seems to me no more than just that I should know my accuser, and that the public should be in a position to estimate what weight should be attached to an attack thus indirectly made, and calculated to affect me most injuriously with the department of which I am the engineer, and with the public, to whom the execution of a work of such importance is necessarily a matter of interest and observation.

I now proceed to make a few observations in reply to those parts of the report of Messrs. Rendel and Simpson, which appear to me to be pertinent to the questions under consideration of the Committee.

In *viva voce* discussion before the Committee, it was difficult to draw from Messrs Rendel and Simpson such an elucidation of the facts and opinions given in their report as, I am satisfied, would have militated against the conclusions at which they seem to have arrived. I, therefore, think it right to record in writing my own views of the nature of the construction now in progress for the piers of the New Westminster Bridge, in reply to their report.

It will be unnecessary here to consider the first four heads of the subjects referred to in the instructions to the reporters, and I shall confine my observations to the opinions and conclusions they have based on the 5th and 6th heads of the instructions, viz.—

No. 5. An opinion as to the original scheme, and the exact nature of that scheme; and,

No. 6. The desirability of proceeding with it.

General Description of the intended Structure.

The construction of the foundations resembles those of the Chelsea Bridge, which had been approved by the Duke of Somerset, (then Lord Seymour), when Chief Commissioner of Her Majesty's Woods, after his Grace had caused a careful investigation to be made into the use of the iron facings of such foundations for wharfs, &c., in other localities.

The construction combines all the advantages of foundations on bearing-piles made by means of coffer-dams, without the expense and obstruction to the waterway which they involve, and which would have rendered their use at Westminster Bridge all but impracticable.

Round the bearing-piles a casing of cast-iron piles and plates is driven to an abundant depth into the bed of the river, and tied together and to the timber piles by wrought iron tie-bolts.

Between the piles the bed of the river is dredged to the hard gravel, and the whole space is filled with concrete, so as to form a solid mass.

In the Westminster Bridge, the piers of which are to have granite facing, the iron plates are stopped at six feet below low water, and granite slabs, 18 to 20 inches thick, are substituted for the plates.

Each pier thus consists of 145 elm bearing-piles, driven on an average 29 ft. 6 in. below low-water line, 44 cast-iron piles 24 ft. 9 in. in length, driven 23 ft. 9 in. below low-water line, and 44 cast-iron sheeting piles, 15 feet in length, driven 21 feet below low water, surmounted by granite slabs, eight feet by five feet, rising to two feet above low water.

The bearing-piles are thus 22 feet below the average level of the caissons of the old bridge, and the cast-iron piles and plates respectively 16 ft. 9 in. and 14 feet below that level, and taking the level of the bed of the river in the centre of the arches to be dredged and maintained as low as the bed of the river at London Bridge, the lower edges of the plates would be 9 feet below that bed, the iron piles would be 11 ft. 9 in. below it, and the timber bearing-piles 17 feet below it, while at the piers themselves the ground would be seven feet higher, giving at the piers a depth from the surface of the bed to the edge of the plates of 18 feet. [*See* section No. 3, on Plan No. 2.]

Fifteen borings were made into the London clay to a depth of 40 feet, and one boring was carried to the depth of 60 feet. Specimens were retained of every foot of these borings, and the clay was found of an uniform and dense character.

In driving the bearing-piles into the clay, the degree of resistance specified for each pile was not attained so soon as was anticipated, which accounts for the additional length of the piles beyond what was specified in the contract; and to obtain a greater area of piled surface, I thought it advisable to increase the number of bearing-piles originally contemplated.

A comparison of the weight of the superstructure and piers upon the piles and area of the foundations of New Westminster Bridge with that upon the substructure of other metropolitan bridges will be interesting and satisfactory. Supposing the piles themselves

to

to bear the whole weight, the pressure on each pile of Westminster Bridge would be 15 tons; and supposing the weight to be distributed over the surface of the ground comprised within the entire line of the iron plates, the pressure would be two tons per foot superficial.

Comparing these pressures with those on the foundations of London Bridge, which structure, from the observations by Sir John Rennie and myself, made for the Corporation of London in 1854, had not moved for the previous 20 years, the results are as follows:—

Pressure on each pile in Westminster Bridge - - 15 tons.
Ditto - - - - on London Bridge - - 80
Pressure on each foot of ground at Westminster Bridge - 2 tons per foot.
Ditto - - - - London Bridge - - 5 ⅓

And comparing the pressure of the New Bridge with that of the present Westminster Bridge, it results that the pressure under the old bridge is six tons, or three times that due to the new structure.

It is admitted by the Reporters that my efforts to avoid the cost of a temporary bridge and coffer-dams are laudable; but they object to the mode by which I endeavour to attain this result, and they give a detailed description of my plan, which, however, very imperfectly exhibits the nature of the structure.

Their words are—"That the piers below low water are formed of a series of wooden "piles, surrounded by a sheeting of cast iron, the space enclosed by this sheeting being "filled in with concrete;" and they characterise them "as dependent on the combined "action of several classes of materials, differing in their strength as well as in the manner in "which they are applied."

In my opinion, a fairer idea of this structure would be given in the following terms:—

Considering the manner in which the timber, iron, and concrete, mentioned by the Reporters, are used, the piers, from the level of 16 feet below high-water, Trinity datum, must be looked upon as a solid mass of incompressible and indestructible materials, "carried down deep into the London clay," and terminating 48 feet below the level of Trinity high-water mark.

When I say incompressible and indestructible, I mean, of course, within the ordinary limits which govern all structures.

In proof of my description, I proceed to consider, seriatim, the separate constituents of the pier, and the part they play in its structure.

The elm piles are 14 inches square; they are driven with a ram one ton weight, or with a steam ram 1½ ton weight, to a depth of 19 feet into the solid London clay, and 24 feet into the bed of the river.

Supposing these piles to bear the entire weight of the structure, they would be ultimately loaded, as before stated, with a weight of 15 tons each, or 12 tons per square foot in the pile.

The following examples of the loads borne by piles prove that this is an unusually small load for the bearing-piles in foundations.

	Diameter of Pile.	Loaded with	
		Total.	Per Sq. Foot.
	Inches.	*Tons.*	*Tons.*
Neuilly - - - - - -	12	47	47
	12	47	47
Orleans (pine) - - - - - -	12	46½	46½
	12	46½	46½
Hull Docks - - - -	10	25	37
London Bridge - - - -	14	80	44
Albert Warehouses, Liverpool, - - - -	14	80	44
New Westminster Bridge - - - -	14	15	12

It is a well-known fact, that the elm piles would bear, without permanent alteration, a compressive force of 200 tons each. As regards flexure, as they are surrounded by concrete where not in the bed of the river, they cannot be subject to that strain. As regards durability, they will be entirely cased up in materials protecting them from the alternate action of air and water, and in such circumstances timber does not decay; therefore this portion of the pier is incompressible and indestructible.

The concrete deposited round the piles is formed of gravel and Portland cement; it is of a very dense character, its specific gravity being 2·3, that of granite being 2·66. This concrete rests upon a dense bed of gravel, overlying the clay; and supposing the concrete surface to bear the total weight of the structure and load, independently of the piles, the pressure on each square foot would not exceed 2 $\frac{8}{10}$ tons; supposing the weight to be carried by the entire surface of the pier, the pressure would be two tons per foot superficial upon the bed of clay, which is now subject to a pressure of 6 tons per foot superficial under the piers of the old bridge, and to 5 $\frac{8}{10}$ tons on the foot superficial at London Bridge, as before stated.

The exterior of the pier is a solid and continuous *facing* of cast-iron and granite, closely fitted and bound together, and to the elm piles, with strong wrought-iron tie-bolts. The

Appendix, No. 2.

weight upon the granite, after the bridge has taken its bearing, would be two tons to the square foot; the crushing weight of granite is five tons to the square inch, or 700 tons to the square foot.

Each cast-iron guide or main pile (15 inches diameter, the metal being one inch thick) is driven 12 feet into the solid London clay, and, in reference to the load it has to bear, is incapable of further sinking. Suppose, for a moment, that the sheet piles have no effect as bearing piles in themselves, but depend entirely on the shoulder which supports them in the main piles, we should then have about 12 tons to be supported on each of the main piles, partly on the top and partly on the sides. And if there were the least tendency to flexure under this small weight, it is prevented by the ties, and by the surrounding strata through which the piles are driven. But, in point of fact, the resistance of the sheet piles from friction, and their absolute strength, is so far beyond the weight they have to bear, that they must, in truth, be also looked upon as bearing piles of great efficiency.

Now, as to durability, it may safely be asserted that, as regards the *mechanical* action of water, or moving materials of the bed of the river, cast iron is indestructible; as regards its chemical action, we have no data to give cause of alarm, but, on the contrary, the use of this material is largely spreading in hydraulic engineering; and numerous instances may be given where it forms the sole dependence of the heaviest structures in water. From my own observations of it when exposed to the action of water from the bed of gravel over the London clay, and from water in the plastic clays, a deposit of oxide of iron is formed on the surface, which actually protects the iron itself; and Mr. Mallet, who has made experiments in great detail, states that iron coated with purified gas tar will last for ages.

This part of the pier may therefore be fairly considered to be incompressible and indestructible; and, as regards fracture from unexpected causes, the solidity of the castings, ascertained by severe tests, is such as to leave no reasonable ground for apprehension on this score.

I have now shown that there are a sufficient number of points of support, and a strong casing; and it remains to show that the whole is connected and bonded together by a homogeneous mass equally indestructible and incompressible with what has been described, in such manner that no part can act independently, and so that the whole pier must be considered at least as complete and uniform in effect, and as if it were, in the words of the Reporters, "a *solid* stone pier founded in the *clay* 38 *feet* below the level of high-water," but with this additional advantage, that the proposed piers are founded 10 *feet deeper* than the Reporters consider sufficient to ensure permanence. A simple inspection of the concrete used, and of the manner in which it is rammed around the piles, and in which it sets and adheres firmly to everything in contact with it, is sufficient to show that the above is a fair and true description of this material, and of the function it performs.

Reasons for dispensing with the use of Coffer-dams.

If the arguments used up to this point may be considered conclusive as to the question of permanency and solidity, it must be obvious that the employment of coffer-dams in the construction of these piers would have been superfluous. So far from agreeing with the Reporters that a coffer-dam is "peculiarly required for this mode of construction," I am satisfied that all the parts of the work being exactly guided and confined to their proper form by operations conducted above low water, so that faulty execution in any of them must be immediately detected and corrected, there could be no advantage to the work derived from the use of coffer-dams, except in setting the granite slabs and securing the ends of the lower tier of wrought-iron tie-bolts, which operations are performed under the eye of an experienced inspector with the diving bell.

It is argued by the Reporters that coffer-dams are required for the more efficacious removal of the old bridge and its foundations, but I shall adduce evidence by Mr. Rendel of a contrary opinion; and in this case, the dams cannot possibly apply to anything but the *foundations*, though the *arches* are mentioned. But to apply this principle, and to include both old and new foundations, the dams must have been of extraordinary dimensions. The level of *the old caisson beds is on the gravel*, and no difficulty has been hitherto found in removing portions of them, nor can I see any likely to arise with regard to the remainder beyond that which attends all operations carried on under water, which in reality may now be performed with as much certainty as works above ground. To suggest coffer-dams for removing these foundations, after an offer has been made, as I shall show, by a responsible contractor, to take down all the old bridge and complete the new bridge in two years from the opening of the first portion, is setting mere opinion against all experience.

It must be borne in mind that works executed or repaired by the use of coffer-dams have not always been attended with satisfactory results. I may instance the case of Blackfriar's Bridge, which was founded in coffer-dams in 1760, and in consequence of the settlement in some of its piers, was repaired by Messrs. Walker and Burgess in 1844, also in coffer-dams. The subsequent failure of this structure, two of its arches being now supported by centering, furnishes a case of the inefficiency of founding and repairing bridges by coffer-dams.

Again, New London Bridge, founded in coffer-dams of great size and strength, was, notwithstanding the excellence of the material and workmanship, subject to a settlement in all its piers, varying from 6 to 10 inches on the down-stream side of the bridge.

Lastly, the piers of old Westminster Bridge, also repaired by Messrs. Walker and Burgess by the use of coffer-dams, which were admirable in their construction, sunk, as the Committee are aware, before the repairs of the bridge were completed.

I must

I must now call attention to the recent and important instances in various countries where engineers, entirely discontinuing the costly apparatus of coffer-dams for founding most important structures, have substituted in many cases, systems similar to, but often far less perfect than, the one I have just described.

On the Continent it has become an almost universal practice, during the last 30 years, to make the foundations and the piers of bridges in deep water, by means of a series of timber bearing-piles carried up above the bed of the river near to low-water level (thus forming part of the pier), surrounded by a sheeting of timber (a much more destructible material than cast-iron), the space enclosed by the sheeting being filled in with concrete; and the bed of the river being formed and protected outside the sheeting by rough concrete or loose rock-work round the pier.

In reference to this mode of protecting the bed of the river, I beg to call attention to the simple, inexpensive, and efficient method described to the Committee by Mr. Rendel, as having been adopted by himself under the Lary Bridge at Plymouth about 30 years ago.

The following are a few of the bridges constructed in this manner; since 1824.

1st. Concrete cased in timber:—

Name of Bridge.	River.
Asnières	Seine.
Carrousel	Ditto.
Cubzac	Dordogne.
Indre	Indre.
Langon	Garonne.
Aiguillon	Ditto.
Souillac	Dordogne.

2d. Bearing piles and concrete cased in timber.

Chepstow	Wye.
Marienburg	Nogat.
Dirschau	Vistula.
Wronke	Warthe.
Seville	Guadalquiver.

3d. Piles and concrete unprotected by casing.

Rouen	Seine.
Jena	Ditto.
Austerlitz	Ditto.
Alma	Seine.
Victoria	Ditto.

The accompanying tracings of the foundations of many of these bridges illustrate the views above explained.

The question of permanence of such foundations has been settled by the experience obtained by the durability of the piers of old London Bridge, which was really similar in construction to the new Westminster Bridge, although with fewer bearing piles, and those disposed round the outer edge of the pier. Fig. 2, Plan No. 2, of the Appendix, represents the construction in which the two rows of triple bearing piles are marked by the letters *a, b, c*, and the sections of the sterlings are shown by the letters *d, e, f*. These sterlings form the protection to the pier, and are represented in the new piers of Westminster Bridge by the iron sheeting piles and granite slabs.

Old London Bridge was a structure of 600 years' duration; the tops of its piles were at the level of the low-water line, and when the bridge was removed, they were drawn out in a sound state. The weight of the houses on the bridge must have thrown a great and unequal pressure on the foundations, and yet the bridge stood in excellent order, although exposed to the scour of the ebb tide, which ran like a rapid under its arches. The state of the piles of the bridge affords a strong confirmation of my views on the durability of the piles of Westminster Bridge at their present level; but to cut them at the level of the low water in the Pool, as suggested by Mr. Stephenson, can be effected without inconvenience, and it is a suggestion I would willingly adopt.

Instances of employing Cast Iron as an outer Casing.

The following are some of the structures in England, Ireland, and elsewhere, in which cast or wrought iron is employed as a support or outer casing in rivers:—

	Name of Engineer.	
Chepstow Bridge	Brunel	Cast iron and concrete piers, 60 feet high.
Windsor Bridge	Ditto	Ditto - ditto as cylinders.
Sutton Wash Bridge	Stephenson	Cast iron, and brickwork and concrete.
Windsor, Yssel, and many other bridges.	Locke & Errington	Cast iron, brickwork, and concrete.

Appendix, No. 2.

	Name of Engineer.	
Yare Bridge -	Bidder	Cast iron, brickwork, and concrete.
Two bridges at Windsor	Page -	Cast-iron piles, bearing piles, and concrete.
One bridge at Chelsea	Ditto	Bearing piles, cast-iron sheet and guide piles, and concrete.
Victoria Dock Walls	Bidder	Cast-iron sheet and guide piles and concrete.
Blackwall Wharf	Ditto	Cast-iron sheet and guide piles, with concrete.
Rochester Bridge	Cubitt	Cast iron and concrete.
Liffey Wharf	Ditto	Granite wall on cast-iron piles.
Wye Bridge, Hereford	Liddell & Gordon	Cast-iron sheet and guide piles and concrete.
Shannon Bridge - -	Hemans	Cast iron, filled with rubble masonry.
Wexford Pier	T. Clarke	Cast-iron columns.
Gravesend Pier	Ditto - -	Ditto.
Gravesend Girder Pier	Redman	Ditto and concrete.

Besides these, there might be quoted numerous lighthouses, in the most exposed situations, of cast iron in various forms.

The above instances surely afford overwhelming evidence that coffer-dams may be abandoned without danger to the structure; that structures, founded on piles, concrete, and cast iron are considered permanent in the present practice of the profession, and that I am fully justified in their adoption.

Alleged Danger to Foundations from an anticipated Scour of the Bed of the River.

I now turn to the words of the reporters—"We cannot but think it probable that the "bottom of the river will not retain the peculiar form intended to be given to it. Should "this be the case, the concrete banks around the piers must, in no long time, be broken up, "and the piers be weakened; first, by the increase of their unsupported height, and "secondly, by the diminution of the depth and solidity of the material through which the "piles, of which they mainly consist, are driven."

This implies that the bed of the river is to be scoured away to some considerable depth below the line shown on my design. Now, in point of fact, the probabilities of a great scour will be diminished by the construction of the new bridge, inasmuch as it will considerably enlarge the sectional area of the waterway.

As to the changes in the bed of the river, I have given the subject considerable attention, and in 1843 made soundings for Her Majesty's Commissioners on Metropolis Improvements between Vauxhall Bridge and Blackwall, comparing them with the soundings of the river made by Mr. Giles for the late Mr. Telford, in 1823 above London Bridge, and with the soundings made for the late Mr. Vaughan in 1799 below London Bridge.

Taking the average soundings in the Pool at 33 feet below Trinity datum, and the deep soundings at London Bridge at 30 feet below Trinity datum, the deepening of the river upwards at one foot per mile would give for the deepest soundings at Westminster Bridge 28 feet.

In the section of the bed under the arches of the new bridge, I provided for a depth by dredging of 30 feet below Trinity high-water line, which is a depth equal to that at London Bridge, and I arranged such a sectional area of waterway as would allow the stream to pass without any increased velocity at the bridge; so that, in reality, until the bed of the river were equalized between London Bridge and Westminster, there would be a *deposit* and *not a scour* at Westminster Bridge; but this equalization of the bed of the river between Westminster and London Bridge would lay bare the platforms on which the piers of Waterloo Bridge rest.

The following statement of the sectional area of the waterway under the metropolitan bridges below Trinity high-water mark, will prove how imaginary is the idea of the scour on which so much stress has been laid.

	Superficial Feet.
Old Westminster Bridge	16,633
New Westminster Bridge - -	18,585
Hungerford Bridge	21,811
Waterloo Bridge	20,844
Blackfriars Bridge	16,447
Southwark Bridge	14,628
London Bridge	17,026

That the Committee may be convinced there is nothing to apprehend to the new bridge by the deepening of the river, I will mention two facts which I would prove by evidence, viz. that

that the scour through the great arch of Old London Bridge having formed in the bed of the river (above and below that structure) a deep gulph, with 30 feet at low water, this gulph was filled up, when the old bridge was removed, by the rubble stone and mortar from the old bridge, and any scour at that part would be effectually prevented.

Again, at Waterloo Bridge, where a regular series of soundings are taken every six months, there has been no change in the bed of the river during the last three years.

Being the engineer referred to on the part of the Crown during the last 12 years, to report upon all cases where applications have been made to the Corporation of London (and by them referred to the department of Her Majesty's Land Revenue, under the Commissioner, the Honourable Charles Gore) for works on the bed and shore of the Thames, I may be allowed to speak with some confidence on this part of the subject; and having pointed out, in 1843, that a general lowering of the bed of the river would take place in the course of years, it is not probable I should be unmindful of this circumstance in arranging the piers of the New Westminster Bridge; and I would state, with the fullest confidence, that the bed of the river round the piers of the bridge could not be disturbed by the changes in the river, nor would the piers be at all affected by that change.

But to place the matter beyond doubt, I have collated my memoranda on the tidal action of the river, and I find that, taking the mean level of the sea at Sheerness at 11 ft. 2½ in. below Trinity datum, a series of tidal observations for the month of February 1843, shows that the low water at Sheerness was 18 ft. 2½ in. below Trinity datum, and the low water at St. Katherine's Docks was 18 ft. 0½ in. below Trinity datum, showing, as I told Mr. Rendel before the Committee, that the sea low-water level had already been attained in the Pool, where the tide ebbs at times two feet below the low-water level at Sheerness.

Again, the mean low water at Sheerness, from three years' observations, is 18 ft. 5⅜ in. below Trinity datum, and the low water at Westminster Bridge for the month of May was 17 ft. 4½ in. below the same datum, only 12⅞ in. above the mean low water at Sheerness. Another proof of the fallacy and danger of putting forth opinions formed without a knowledge of the facts and circumstances of the case.

The Committee will observe that the assertions by Messrs. Rendel and Simpson are supported by *no proof*; that they make a general statement, "that judging from the effect of "the river on the several bridges, they do not feel *that any plan which does not comprise solid "stone piers and abutments carried down deep into the London clay, can be regarded as possess-"ing a permanent character*," and they thus would stultify the works of those celebrated engineers, the Rennies and Brunel.

Now the fact is, that the only bridges affected are Westminster Bridge and Blackfriars, the former on account of its having no bearing piles whatever (although Mr. Rendel stated in evidence that "it was repaired under the idea of its being a safe bridge, from the fact of "its having bearing-piles"); and the latter, viz., Blackfriars Bridge, having failed in consequence of its bearing-piles being *insufficient*.

But if a scour were to take place, and that to the very improbable extent suggested by the reporters, viz., of the whole stratum, about six to eight feet thick of strong gravel which is above the London clay, and the concrete embankment outside the pier (which will be of the consistency of rock), were to be "broken up," what would be the consequence to the *pier itself*, supposing (which it is difficult to do even for argument sake) that this improbable movement could not be *easily arrested*?

There would remain within the iron casing of the pier the portion of gravel stratum originally enclosed on which the concrete rests. This gravel is incompressible and immoveable so long as it cannot escape sideways; and the same reasoning applies to the London clay, which constitutes the remaining portion of the materials enclosed.

As from the nature of the construction of the pier there can be no opening in the casing to allow the passage of the gravel, it is impossible to conceive how the gravel could escape sideways. And as to the *diminution of the depth and solidity of the material through which the piles are driven*, this is surely an oversight of the Reporters; for the piles on which the piers bear are *inside* the casing, and no alteration in the resistance there can take place till the casing be undermined by being washed under. Now, the foot of the casing is *deeper in the London clay than the solid masonry proposed in the Report*. Thus again we have a conclusion arrived at without a reference to the facts.

I will here mention, in reference to the bed of gravel enclosed in the casing, so as to form a part of the pier, that the drawings of the foundations of Hungerford Bridge, coupled with Mr. Brunel's evidence, in 1844, of the nature of these foundations, explain it to be a bed of brickwork resting on the top of this very bed of gravel, the area being enclosed by a timber sheet piling. If, therefore, this gravel should be carried away outside, as the Reporters anticipate, the Hungerford Bridge foundations will present only a timber defence. The Westminster Bridge foundations will present an iron one at the same relative level. Mr. Brunel's experience is surely a sufficient guarantee that nothing is to be apprehended as to the scouring away of this bed of gravel.

Although the Reporters condemn the scheme as defective in many of its details, more especially in the construction of the piers below low water, and recommend that the piers and abutments should be of solid stone carried down deep into the London clay, yet Mr. Rendel states, (298,) "If I could be quite certain that I could make this concrete which is "put round the piles and is brought up to the level of the plinth course as unyielding as "those piles, then I should say that was a firm foundation."

Now that he can be quite certain of this result is proved by his answers before the Committee on Westminster Bridge, June 1844, when, being questioned by Sir Charles Burrell as to the fact of the bed of gravel under the old caisson of the bridge being enclosed by

Appendix, No. 2.

the concrete and sheet piling so that it cannot move, he answers, "*Certainly it cannot move, "and I do not think it would be possible to compress that bed of gravel.*"

Hence the gravel and concrete being incompressible, while the timber is slightly compressible, Mr. Rendel's conditions of a firm foundation are actually fulfilled.

Again (Ans. 227), Mr. Rendel explains his ideas that the clay owes a portion of its ability to support weight to its *continuity*, which being cut off, there being no *bearing piles* to carry the weight of the pier, the pier sank. And again (233), his ideas of a permanently-founded bridge are, "a bridge having its foundations carried so deep into the London "clay as to ensure not only a strong foundation for it to stand upon, but a depth to which "the river can never reach," or, *a bridge founded on piles in the ordinary way.* He illustrates this latter condition by reference to his bridge over the Lary, at Plymouth, which he says is a bridge standing upon a quicksand, *on piles.*

So far, therefore, as relates to the efficacy of the piles to support weight, and to the incompressibility of the gravel, Mr. Rendel's evidence of 1844 is conclusive.

The concrete being more unyielding than the piles, and the gravel being incompressible, the result is that any weight on the piles or concrete, or both, would be transferred to the clay. Mr. Rendel's reasons why the piles in my pier would not bear *equally* are based upon the absence of a timber grating or platform resting on and secured to the pile heads. Now, instead of this grating of timber, I substitute stone blocks or caps upon the pile heads, and upon these again are fixed the large granite plinth course two feet six inches thick, which from its size and thickness effectually diffuses the pressure over the piles and concrete. There is also this advantage in the granite platform over the timber platform, that the latter disposed sideways on the piles would be subject to actual compression, as may be seen in one of the caissons of the old Westminster Bridge, where the weight of the pier has caused an indent in the timber two inches in depth, and consequently must have produced a settlement of the pier to that extent.

In my arrangement all the timber is subject only to compression in the direction of its fibre, and it is loaded only with a weight which would not sensibly compress it in that direction, though it would in the other.

In both cases, whether the diffusing platform be timber, or granite, or concrete, the pressure comes upon the clay, and the foundations really terminate deep in the London clay, viz., at a depth to the shoes of the piles of 48 feet below high water Trinity datum, a depth of 10 feet lower than that which is mentioned for the piers proposed by Messrs. Rendel and Simpson.

The opinion of Messrs. Rendel and Simpson upon the permanency of the piers is based on the assumption,—First, that the concrete footings round their bases constitute a necessary portion of the structure; next, that these concrete footings, forming part of the new bed of the river, will be broken and scoured away by the stream.

In reality the concrete footings will form no part of the structure. They are to be deposited at a depth below that to which the river can by possibility scour, and they are intended to guide the stream towards the centre of the arches under which the deepest water would, in the first instance, be provided by dredging, and afterwards maintained by the scour as thus directed; an engineering expedient so usual, that it may be called universal. The Committee have seen a sample of this concrete cut out of No. 4 Pier, four months after its formation, and may judge whether a stream of three and a half miles per hour would affect such a hard conglomerate, which Mr. Stephenson described as "the best concrete he had ever seen, and equal to the Portland stone of the old "bridge."

This expedient has been described by Mr. Rendel as a dam across the river, whereas it only extends round the piers, and it completely excludes both air and water from the iron sheeting piles, and their junction with the granite facing above them.

Taking Mr. Rendel's answer to a question from Mr. Tite (241), "I doubt very much "whether the stream would be able to deepen entirely down to the clay," it would appear that the precautionary footing of concrete is carried lower than Mr. Rendel himself deems necessary, seeing that it is carried down to the London clay.

On the Removal of the Old Bridge.

On the removal of the old bridge, the opinions of Mr. Rendel in 1844 differ widely from his opinions in 1856.

In 1844, being asked (248), "When you speak of the comparative expense of a new "bridge and of repairing the old one, do you take into consideration the expense of "removing the present piers, and the foundations of the present piers? Must not that be "all done by coffer-dams?"

Answer:—"*No, the old piers will be removed with very little difficulty.* I should say, "*that the old piers would be removed with very great ease.* The drawing of all those piles "which are driven round them would be a more formidable operation, but I apprehend not "an operation attended with any heavy expense."

In the Report of 1856, pp. 5 and 6, a new view of the subject is taken, thus: "This is "a case *specially demanding the aid of coffer-dams for the better, cheaper, more expeditious, and "safer removal of the arches and foundations of the old bridge.*" And again, in evidence (272), Mr. Rendel says, "You would not only with your coffer-dams have the means of building "the new bridge in the manner there recommended, but you would also have the means of "taking

" taking up the foundations of the old bridge, which I confess I look at as a matter attended " with *some considerable degree of difficulty*."

Again, in the Report, p. 3, " We also think that there is great doubt as to the practica- " bility of safely founding the new piers on the sites of the old ones without very consider- " able difficulty and expenditure in the removal of the old foundations and stone deposits."

Thus the evidence given by Mr. Rendel in 1844 to guide Parliament as to the erection of a new bridge in or near the site of the old bridge, and which, no doubt, influenced the decision of Committees and of the Commission, is diametrically opposed by his Report and Evidence of 1856.

I am satisfied that the piers and caissons of the old bridge can be removed with very great ease, as stated by Mr. Rendel in 1844, and Messrs. Cochrane's offer to undertake the maintenance and removal of the bridge for 2,500 *l.* ought to be conclusive upon this point. The effect of the weight of the old piers on the gravel and clay will be an advantage rather than a difficulty in forming the new foundations. I may here mention, that old London Bridge and its foundations were removed without the aid of coffer-dams.

Construction of the Bridge in independent lateral Sections.

The Reporters proceed to give an opinion on the inexpediency of building the piers in connected sections, alleging that it would be better to construct the whole of the bridge, except the road plates, in two detached portions, for fear of unequal settlement.

On this part of the construction of one part of the bridge before the other the Committee may require some detailed information; I therefore have shown on the accompanying section (No. 2), the position of one of the old piers, No. VII., and of one of the new piers, No. III. The cutwater and caisson of the old pier are cut away to the line *a. b.*, and the iron and timber piling of the new pier are completed to the same line.

The superstructure of the first part of the New Bridge would occupy the space from *c.* to *d.*, leaving a footing or projection of the foundations of 5 ft. 2 ½ in. towards the Old Bridge. The Committee will observe, that the piles, &c. of the new foundations have been driven home close to the caisson of the old pier without any settlement in the latter, although it only rests on the gravel, without any other support. The statement that the driving of the piles in continuation of the foundations would disturb the piled foundation of the New Bridge, which are deep in the clay, is too manifestly incorrect even to require contradiction.

Again, as the piles of the continuation will be submitted to a much greater force in driving than the superincumbent weight which they are to bear, no settlement, when that weight comes upon them, need be apprehended.

In the formation of foundations in detached lengths I had great experience in the worst ground at the Thames Tunnel, the foundations of which could only be proceeded with in lengths of from two feet to three feet, and even when these foundations were put in, in the sand itself, the work was effected without settlement, by very simple expedients.

The practice of connecting together portions of tunnels, bridges, and other works built independently on every variety of foundations, sustaining immense weights, is so familiar that I cannot seriously entertain this objection in a case like the present, where every main point of support is *compelled to reach an identity of foundation*, viz., the London clay.

Suggested Modifications of Plan.

In the evidence given by Mr. Stephenson and Mr. Hawkshaw, certain modifications in the detail of the foundations were suggested, which consisted in fixing the heads of the timber bearing-piles at a level below the lowest low-water line, and introducing a granite string course below the granite plinth of the piers, to receive any blow from barges passing under the bridge at dead low water.

Mr. Rendel would be satisfied that the foundation was firm if the concrete were as unyielding as the piles. This condition I have fully shown will be satisfactorily fulfilled.

Mr. Hawkshaw advised a projecting granite course to receive the blows of any vessels passing close to the pier at dead low water. As the navigation would be under or towards the middle of, the arches, it is not probable that any vessels would navigate near the piers, and at ordinary low water they could not strike the pile caps; but if precautionary measures are deemed necessary, there is no difficulty in arranging the masonry to afford protection against vessels.

All these suggestions are merely precautionary, and do not in the least affect the principle of construction.

Of the Temporary Bridge.

I come now to the opinion of the Reporters that " the saving of the cost of a temporary " bridge is not a sufficient compensation for the trouble, delay, risk, and extra cost conse- " quent on the construction of a bridge in even two sections as now proposed, and the first " in such close proximity to the old bridge.

On this subject I beg to refer the Committee to Mr. Rendel's opinion before the Commission on Westminster Bridge in 1851. In answer to a question (343) from the Earl of Lonsdale, Mr. Rendel says *he would leave the old bridge until the new bridge was constructed*,

Appendix, No. 2.

and would save the cost of a *temporary bridge*, and also that he would (344) place the new bridge *immediately on one side of the old bridge*. In answer to a question (347) by Sir R. H. Inglis, he states "that the old bridge would perfectly answer the purposes of a temporary "bridge while the new bridge was being constructed." In answer to Lord Seymour (349), whether "using the present bridge as a temporary bridge, and building the new bridge "adjoining it, in order to make it of such a width as a bridge for the traffic ought to be, "will it not cover part of the site which the present bridge now occupies?" Mr. Rendel states, "I have not gone minutely into that, but if it should be so, *I think no difficulty would "present itself but what would be easily overcome.*" Again, in answer (353), he reiterates the importance *of saving the expense and delay of a temporary bridge*, and the removal of the present bridge before the new one is built. It thus appears from Mr. Rendel's conclusion —evidence given in 1851—that he was decidedly *against a temporary* bridge, and that he saw "no difficulty in constructing the new bridge immediately on one side of the old bridge;" also, that if the width of the new bridge were to include part of the width of the old bridge," he *thought no difficulty would present itself which might not easily be overcome.*

By referring to my plans, it will be seen that what Mr. Rendel thought the best in 1851, I am now carrying out in 1856. I save the delay and expense of a temporary bridge; I use the old bridge until part of the new bridge, 33 feet wide, is built immediately adjoining the old bridge. I provide for including more than *part* of the width of the old bridge in the width of the new bridge (in doing which, Mr. Rendel thought no difficulty would present itself but what would easily be overcome). I avoid the use of coffer-dams and centres, and thus keep open the navigation. *I am, in effect, working out all the suggestions which Mr. Rendel approved of in* 1851, and *have overcome* the difficulties he anticipated would be overcome in doing so, and I now respectfully submit whether the opinions given by Mr. Rendel in 1851 should be set aside completely by his Report of 1856.

Of the Superstructure.

The flat curves of the arches of the bridge, and their proximity to the roadway consequent upon the thin crown, rendered it desirable to provide for security and stiffness of the structure in such a manner as would avoid the use of cast-iron in the central parts of the arches where they might be subject to percussions from moving loads. I therefore designed the arches with wrought-iron central ribs of ample strength and stiffness, whether taken as an arch or girder. In the centre arch these ribs are 52¼ feet in length by 28 inches in depth; in the third and fifth arches, 50 feet 3 inches in length by 26½ inches in depth; in the second and sixth arches, 45 feet 6 inches in length by 24 inches in depth; and in the first and seventh, 42 feet 3 inches in length by 22 inches in depth.

All the arched ribs are considerably stronger than is requisite for any load that can possibly be brought upon them, and they are made of this strength in order to secure great stiffness. And for this object I treated the wrought-iron rib as a fixed girder, taking the depth at the crown as an uniform depth for the girder, and under these conditions the breaking weight of the rib as a parallel girder would be 100 tons.

The deflection of the rib as a parallel girder fixed at the ends, and with a load of half a per foot distributed over its length, would not amount to more than ·15 of an inch with that load.

It will be evident, therefore, that the ribs, although so flat a curve, have a superabundance of stiffness, because in those calculations I have made no allowance for the increasing depth towards the ends, which amounts to 18 inches.

Some question has been made upon the provision for expansion in the iron part of the structure, and an impression conveyed that this has been neglected. Messrs. Rendel and Simpson inquired of me upon this subject, and were informed that the expansion in the longitudinal girders was provided for by vulcanized indian rubber in the joints. On this length of longitudinal girders from arch to arch, divided into three divisions, there would be an increase in length by a total change of temperature of 50° of ½ inch, or ⅙ inch at each joint.

There is no provision for expansion in the arches, which would rise and fall as in other iron bridges according to the change of temperature, in this case extending to half an inch each way; but Mr. Stephenson has made a suggestion which would allow this rise to take place more easily in the wrought iron centre arched ribs.

It is a practice with some engineers to so fix the iron, that the force from expansion is expended upon the iron itself, exerting a compressive force of one ton per square inch for every 15 degrees of increase of temperature.

On this part of the subject the Reporters state, at page 6 of the Report, that "they would "make some additions to the thickness of the piers, and to the strength and stiffness of the "iron superstructure." This conclusion is at variance with Mr. Simpson's evidence; for, in Answer 289, he states, "that he has gone into the question of the strength of the bridge "as regards the arches, and everything, and that he thinks there is ample strength."

Of the Width of the Bridge.

As to the width of the bridge, which the Reporters recommend should be 60 feet, it is right to draw the attention of the Committee to the width of the streets leading the streams of traffic to and from the bridge on both sides of the river. These are on the Middlesex side— Bridge-

	Width of Carriage Way.		Aggregate Width of Footpaths.		Total Width.	
	Ft.	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Bridge-street - -	32	0	16	3	48	3
Parliament-street -	39	0	18	9	48	7
Great George-street -	30	9	17	10	48	7
Abingdon-street -	47	9	21	6	69	3
Victoria-street -	40	0	22	6	62	6
And on the Lambeth side—						
Bridge-road - -	45	3	22	0	67	3
Pedlar's-Acre - -	21	0	10	3	31	3
Stangate - -	14	0	10	3	24	3
York-road - - -	33	0	16	3	49	3

Now the width of the new bridge between the parapets is 83 feet, divided into two footpaths, each 15 feet in width, including the curb and two carriage ways, each 26 feet in width, with a curb in the centre, separating the going and coming traffic. These carriage-ways consist of two tramways for heavy traffic, seven feet in width, the remainder being paved granite road for ordinary traffic. For the convenience and enjoyment of the public, it cannot be considered that footpaths 15 feet in width are two wide; and considering the great and increasing traffic of the South-Western Railway, the increase of traffic from Pimlico in consequence of Birdcage Walk being open, and the traffic from Victoria-street and Parliament-street, few will, I believe, venture to assert that the carriage-ways are too wide. It may not be out of place to remark, that Mr. Rendel's decided opinion before the Westminster Bridge Committee in 1851 (answers 351 and 352) was, that the bridge should be not less than 70 feet in width.

Of the Approaches.

Messrs. Rendel and Simpson set down a sum of 384,000*l.* as involved in the cost of the bridge, supposing it to built of a width of 85 feet. In this calculation, they have laid down the line of approach considerably wider than the new bridge, and not in accordance with its northern boundary. An inspection of the plan of the approaches appended to these observations (Plan No. 3), will show that no property would be required on the north or lower side of the present line; and that on the south side, the houses in Bridge-street, Westminster, being required for the Houses of Parliament, would afford the space for widening that street to the width of the bridge. The only buildings to be removed for the approaches are seven houses between the bridge foot and Stangate, on the Surrey side, which may be estimated at 45,000*l.* Therefore, so far as the bridge approach is involved, the sum of 384,000*l.*, set forth in the Report is really in excess to the extent of 339,000*l.*

On the Cost of the Bridge proposed by the Reporters and the Bridge in course of execution.

	£.	*s.*	*d.*
The estimate for a bridge 85 feet wide is stated by Messrs. Rendel & Simpson at - - - - - - - - - -	326,000	–	–
To which must be added the estimated cost of the temporary bridge -	35,000	–	–
To this must also be added the sacrifice of the work already done, and of part of the materials in stock, taken by them at - - - -	57,000	–	–
Making a total for the 85 feet bridge of - - - £.	418,000	–	–

(This sum is exclusive of the cost of blowing up and removing the present works, which may be taken at 10,000*l.*)

	£.	*s.*	*d.*
Then for the 60 feet bridge the estimate is - - - - - - - - - -	218,000	–	–
Cost of temporary bridge - - - - - - - - - - - -	35,000	–	–
Sacrifice of works and part of stock, as before - - - - - - - - -	57,000	–	–
£.	310,000	–	–

The time for completion being five years in each case.

In comparison with these estimates, I would observe that the estimate for the completion of the first part of the New Bridge, 33 feet in width, is as follows:—

Appendix, No. 2.

	£.	s.	d.
1. For completion of foundations of piers and abutments to two feet above low-water 7,854 *l.*, of which there are materials on the ground amounting to 3,517 *l.*; leaving to be provided - - - -	4,337	–	–
For the piers, abutments, and superstructure 51,018 *l.*, of which there is 25,440 *l.* of materials on the ground; leaving to be provided -	25,578	–	–
Total for completing first part of Bridge in 12 months - - £.	29,915	–	–
For the removal of the Old Bridge, and the completion of the new structure, 85 feet in width - - - - - - - - -	121,255	–	–
£.	151,170	–	–
Amount already expended, as per Mr. Stephenson's valuation - -	55,053	–	–
£.	206,223	–	–
Maintenance of Old Bridge - - - - - - - - -	2,500	–	–
£.	208,723	–	–
Add 5 per cent. on 151,090 *l.* in consequence of delay.—*See* Messrs. Cochrane's Letter, 24 June 1856 - - - - - -	7,558	10	–
£.	216,281	10	–

General Conclusions.

I should state that the engineering arrangements for constructing the bridge have been most suitable to the circumstances under which the work had to be done, combining the maintenance of the Old Bridge for the traffic, and space for the navigation under its arches; that every operation hitherto has been perfectly successful, excepting in point of time, over which I had no control—that the foundations of the New Bridge have been brought up close to the south face of the Old Bridge (Plan No. 1), four of its piers and caissons having been cut through in that operation—that responsible contractors are ready to undertake the completion and opening for traffic of the first part of the bridge in 12 months from the recommencement of the works, and to remove the Old Bridge and complete the new structure in two years from the completion of the first section; and that the cost will not exceed the amount authorised by the Lords of the Treasury, unless the purchase of the late contractor's plant by the Board of Works should cause an excess.

In conclusion, I do not consider it falls within my province, more especially after the whole question has been so often and fully considered by Parliament, to advert to the suggestion by Messrs. Rendel and Simpson of a new bridge at Lambeth, and an alteration of the contemplated width of the New Westminster Bridge. On this subject I would only beg to bring under the notice of the Committee the danger which may possibly result to the stability of the present structure, and to the navigation, should the suspension of the works be much longer continued, and the fabric be exposed to the contingencies of a winter season, especially as four of the piers of the old bridge have been cut through for the foundation of the new bridge.

Tho. Page.

APPENDIX.

STATEMENT showing the DEVIATIONS which have been made from the CONTRACT DRAWINGS, with their effect upon the CONTRACT AMOUNT, and the Dates when they were adopted.

1. An alteration in the design of the Surrey abutment, by which three culverts were introduced instead of the two arches. This alteration was suggested by Sir Charles Barry, to improve the architectural effect, assented to by me, and approved by Sir William Molesworth. It was determined on the 26th July 1854, and would reduce the contract amount by 3,000 *l.*

2. Driving of the bearing-piles instead of screwing them, saving screw points to the amount of 1,290 *l.* This alteration took place in July 1854.

3. The substitution of a through course of granite at the base of the piers, 2 ft. 6 in. thick, in place of the iron curb, and the two layers of 9 in. Bradford landings. It was agreed with the contractor that this alteration should be made without affecting the contract amount. It was determined on July 1854.

4. Substituting

4. Substituting for the three large cast-iron ribs the ordinary ribs of the bridge. This alteration was made in August 1854, and added one foot four inches to the available width of the bridge, a quantity equal to one-sixtieth of the whole, and therefore gave an increased convenience to the public, while the change will cause a deduction of 1,008 *l.* With reference also to this alteration, I consider it desirable for the following reasons, viz., that the great rib on the south side would have caused interference with the carriage traffic, when the first part of the bridge should be opened; and again, that a difference in the expansion of these ribs, and of the wrought-iron ribs in the centre of each arch, might have led to some irregular strains in the structure, and also that it would be desirable to construct all the arched ribs of the bridge on the same principle.

5. Substituting wrought-iron buckled plates for the four-inch oak planking for the flooring of the roadway. This alteration was made partly by reason of the difficulty experienced in procuring ship oak planking of the required size and quality, and was proposed to be made without any addition to the contract sum, provided part of the diagonal ribs and some of the wrought-iron bearers were omitted, which, by the adoption of the plates, could be dispensed with without detriment to the strength of the roadway. This alteration was determined on April 1855.

It is also intended to construct the interior of the piers of solid brickwork instead of filling the spaces shown by the contract drawings with concrete. This alteration would cause an addition to the contract sum of 696 *l.* Arranged September 1854.

The balance of these deviations would be a sum of 4,602 *l.* in reduction of the contract amount.

The extra piling, dredging, &c., being dependent upon the ground, and not deviations from the specification, are not set forth in the list.

Tho. Page.

FOUNDATIONS of BRIDGES constructed without the Use of COFFERDAMS.

NAME and DATE of BRIDGE.	Over the	Number of Arches.	Span.	Total Length of Bridge.	CONSTRUCTION OF BRIDGE.
		Roadway Bridge.			
Alma Bridge, Paris - -	Seine -	3	141′ 0″	470	- - The arches and piers are built of rubble grouted; the piers are founded on piles driven into and standing above the bed of the river, and distributed over the whole area. The space between the piles is filled in with concrete and rough stones, the whole is enclosed by wooden sheet piling, and protected from the scour of the river by rough stones.
Built, in 1855, by M. M. Michal, under the direction of the Engineer-in-Chief of the Ponts et Chaussées, and finished in the space of five months.					
Saumur Bridge - - - Commenced - - 1756 Finished - - - 1770	Loire -	12	66 0	1,060	- - The arches and piers are of stone. The foundations for the piers were formed by driving piles distributed over the whole area, which piles were cut off by a machine below low water. The space between the piles was filled in with stones, and the whole pier was encased by a row of close piling, which was protected from the scour of the river by fascines and stones kept in place by an external row of piles. The piers, built in water-tight caissons, are sunk on spot on the pile-heads.
It is now standing, and has been subject to all those extraordinary floods of the Loire which has caused such ruin in its districts.					
Nevers Viaduct - -	Loire -	7	138 0	1,250	- - The arches are of iron, the piers of stone, founded on a bed of concrete reaching nearly up to the low-water line, and encased by sheet piling. The whole pier is protected outside from the scour of the river by means of concrete or rough stones.
Built in 1850, under the direction of a Commission of Engineers, composed of M. M. Boucammont and others.					
Ladenburgh - - -	Nechar	7	88 0		- - Stone bridge, founded on piles as before, encased by sheet piling, and protected from the scour outside by rough stones.
Geneva - - - - -	Rhone	5 arches on one side.	51 0		- - Suspension truss bridge pier, founded on piles, driven and cut off above the bed of river, and below low water. The space between the piers is filled with concrete, and encased by sheet piling, protected by large stones.
Ponts de Peney - -	- -	- -	240 0		- - A suspension bridge, founded on concrete above the bed of river, encased by sheet piling, and protected from the scour of the river by large stones.

NAME and DATE of BRIDGE.	Over the	Number of Arches.	Span.	CONSTRUCTION OF BRIDGE.
Souillac - - - - -	- -	-	- ′ ″	- - The piers are of stone, founded on piles distributed over the whole area. The piles are cut off below low water, and stand above the bed of the river, a height about equal to the width of the pier. The space between the piles is filled with concrete, deposited through the water by means of shoots. The foundations are encased by sheet piling as before, with two extra rows of piling outside, the spaces being filled with concrete, and the whole of the foundations are protected from the scour of the river by means of loose stones.
The water is very deep at low water.				
Rouen - - - -	Seine -	- -	- -	- - Stone piers, founded on concrete, encased by sheet piling, and protected from the scour of the river by loose stones. The level of the concrete is considerably above the bed of the river. The piers were subjected to a severe test before being finished.
Wester Voort - - -	Yssel -	- -	- -	- - The piers above low water consist of an outside iron casing backed with a wall of brickwork, 3 ft. thick. The internal space being filled with concrete, the piers below low water consist of iron plates sunk into the ground, the earth then excavated, and the whole filled up with concrete.
Marienburg - - -	A branch of the Vistula.	2 spans	380 0	- - Tubular bridge, founded on stone piers, resting on foundations of piles, cut off below low water. The piers are encased by sheet piling, coming up to low water, and the piers between the heads of the piles and low water are filled up with concrete. The piers are protected externally by rough stones. The river was deepened, and the slopes protected by loose stones.
Dorschau - - - - M. M. Lenge, Engineer.	Vistula	6 spans	397 0	- - The foundations for the piers of this bridge are exactly similar in construction to those of the Marienburgh Bridge before described.
Austerlitz - - -	- -	- -	- -	- - Stone piers founded on piles driven into bed of river, and cut off between the bed of river and low water, and encased by sheet piling, and protected externally by stones, and an internal row of piles.
Jena - - - - -	Seine -	- -	- -	- - Piers are of stone, and exactly similar to the one before described.
Wronke - - - - Built 1845.	Warthe	6	60 0	- - Stone and brick bridge. The piers are founded on piles cut off between the bed of river and low water, the space between piles is filled with concrete. The whole piers are encased by sheet piling, coming up to low water line, and the piers above the piles and below low water are filled in with rubble. The piers are protected externally by loose stone work.
Carrousel Bridge, Paris -	Seine -	- -	- -	- - Stone piers founded below water, entirely on concrete, resting on the bed of the river, and enclosed by wooden sheet piling coming up to low water, and tied across the top by means of iron ties. The depth of the water at low water is 11. 0. The pier is protected by loose stones thrown in round the timber sheet piling.
Lary - - - - -	Lary -	5 arches	100 0	- - Iron arches and stone piers. The piers are founded on rows of piles driven into the bed of the river, and cut off below low water by means of divers and bells. The piers are encased by sheet piling, and the space between the pile heads filled in with stone. The piers were then built in caissons on top of this foundation, and the bed of the river was protected from the scour by means of clay and concrete.
Old London Bridge - -	20	- -	- -	- - Stone arches and piers. The foundations for the piers consisted of three rows of piles driven around the external face of the pier and cut off at low water; the area of the piers up to low water was then filled in with stones; the piers were then built on the tops of the piles and stones; the piers were further protected externally by piles, enclosing an area which was filled in with rough stones. The bridge was of a very massive construction, and had several heavy buildings on it; it was commenced 1176, and finished 1209, and taken down in 1834, after having stood 625 years.

Sir, Whitehall-yard, 20 September 1855.

FROM various circumstances which have come to my knowledge, some of which have been unofficially brought under the notice of the Chief Commissioner, there is, I fear, every reason to conclude that the financial affairs of Mr. Mare, the contractor for Westminster Bridge, may soon be in such a state as to prevent his proceeding with the work.

As it is very important that the progress of the work should not be suspended, and as the dismissal of the workmen would cause a serious delay, I think it right to suggest that authority should be given me by the Board to make proper arrangements for the works being carried on in the event of Mr. Mare suspending operations until another responsible contractor should be found to take a contract for completing the bridge.

I have, &c.
(signed) *Thomas Page.*

John Thornborrow, Esq.,
&c. &c.

Sir, Whitehall-yard, 25 September 1855.

THERE is a circumstance connected with the progress of the works at Westminster Bridge which may lead to embarrassment or delay with the works, and in which it appears to me some steps should be taken.

The wharfs on which materials are deposited (on which material advances were made to Mr. Mare) are sublet by him to the Commissioners of Works. Should the rent of these wharfs not be duly paid, say on the 29th instant, the leases and sub-leases will be void, and the proprietors may ask an increased rent of the Board, or may take a course which would embarrass the operations by preventing the removal of materials, or selling the same for the several rents.

I would suggest that Mr. Mare should be informed that the rents of these wharfs should be paid, and receipts shown for them on the 29th instant, or that the Board should take such other steps of a precautionary nature as the solicitor may deem advisable.

I have, &c.
(signed) *Thomas Page.*

John Thornborrow, Esq.
&c. &c.

Sir, Office of Works, &c., 25 September 1855.

I AM directed by the Commissioners of Her Majesty's Works, &c., to acknowledge the receipt of your letter, dated the 20th instant, calling attention to the state of the financial affairs of Mr. Mare, the contractor for Westminster Bridge, and submitting that you should receive authority to make proper arrangements for carrying on the works in the event of Mr. Mare suspending operations until another responsible contractor can be found to take a contract for completing the bridge, and, in reply, I am to convey to you the Board's authority for carrying the arrangements proposed into effect; but that, in doing so, I am to impress upon you the necessity of taking especial care that no liabilities under the contract are let loose.

I am, &c.
(signed) *J. Thornborrow,*
Assistant Secretary.

Thomas Page, Esq.

Sir, Whitehall Yard, 25 September 1855.

WITH reference to your letter of this day's date, authorising me to make arrangements for proceeding with the Works of Westminster Bridge, in the event of Mr. Mare suspending operations, but impressing upon me the necessity of taking especial care that no liabilities under the contract are let loose; I beg leave to state my impression, that in the event of the works being stopped, Mr. Mare would have broken the contract, and the Board would therefore proceed in the manner best adapted to provide for the security and progress of the operations.

The points to which I would draw attention are these:

1. In the event of there being no funds provided for payment of wages to Mr. Mare's workmen, will provision be made by the Board for such payment, the amount to be received from the next certificate to Mr. Mare?

2. Can I in case of such stoppage make arrangements for the works to be carried on from week to week, by the present staff and workmen now employed by Mr. Mare, until final arrangements are made with another contractor?

Appendix, No. 2.

This is the course I should take if acting on my own judgment, and which I would recommend for adoption, subject, of course, to the opinion of the Board's solicitor; and the object of my letter of the 20th instant was to be provided with powers to act in case of a sudden cessation of operations, which may at any time take place.

I have, &c.

John Thornborrow, Esq. (signed) *Thomas Page.*

Sir, Whitehall Yard, 27 September 1855.

I BEG leave to lay before you, for the information of the Chief Commissioner, the following statement, relative to the affairs of Mr. Mare, the contractor for Westminster Bridge.

Yesterday morning, Mr. Campbell, Mr. Mare's manager of the works, stated to me, that an assistant of Mr. Johnstone, messenger to the Court of Bankruptcy, had applied to him to be allowed to take possession of the works under the authority of that Court; that he, Mr. Campbell, had referred the assistant to the contract, in which provision was made, that in the event of the contractor becoming a bankrupt, the Commissioners of Her Majesty's Works were empowered to take possession of the plant, &c., and to proceed with the works in the manner they might deem best, and Mr. Campbell therefore declined to admit any person to have possession of the works.

The assistant was to return again at 1 o'clock, and was to be referred to me.

Having, with Mr. Campbell, communicated to you the above information, it was arranged to wait for the assistant's return; but as he had not appeared at 3 o'clock, I proceeded to the office of Mr. Lee, the official assignee, to inquire into Mr. Mare's real position, and the circumstance related by Mr. Campbell.

Mr. Lee, with whom was Mr. Johnstone, informed me that Mr. Mare had been declared a bankrupt on the previous day (the 25th), and to avoid inconvenience with all the contracts and loss to the estate, Mr. Lee intended to provide money for wages and other outgoings until the assignees should be appointed, at a meeting of the creditors, fixed for 12th October, at which meeting it would be determined whether the contracts should be further proceeded with or not, but his impression was that a proposal would be made to continue them.

In answer to my inquiries, Mr. Johnstone stated that several Government contracts had been completed by assignees of bankrupts, and he promised to send me a list of them.

With reference to Mr. Mare's next certificate, I informed him that the amount of it would, I expected, be absorbed by claims now before the Board.

The above-named proceedings were then communicated to you for the Chief Commissioner's information, but I recite them here as an official statement.

I may now state that I have had a conversation with Mr. Campbell (who has had charge of the works for Mr. Mare since their commencement, and who, in fact, made the estimate for him in all its details) on a proposal of his to proceed with the works under approved securities, on the same terms and conditions embodied in the present contract, provided the extras claimed my Mr. Mare on the foundations (amounting to 4,000*l.*), and on the pile driving were allowed by the Board, but that he would take no step prejudicial to Mr. Rolt's interest, and that he would return to the official assignee any money advanced by him until he should, as contractor, proceed with the works.

If this proposal of Mr. Campbell's, backed by sufficient securities, were adopted, the work would be proceeded with as under the present contract, but it may be anticipated *more expeditiously.*

If the Chief Commissioner were to allow the assignees to undertake the work on the same terms, the progress and completion would depend much upon their management, which might involve a total change of staff and workmen, and occasion considerable embarrassment.

I make these observations as they occur to me, and will communicate further according to circumstances, and will take any proceedings which Sir Benjamin Hall may direct to enable the Board to arrive at a conclusion so as to proceed with the works by the 12th October.

It has still to be determined whether the works shall be carried on to that date by money advanced through the official assignee; then, whether the seven days' notice shall be given as named in the contract, and other contingencies mentioned in my letter of the 25th instant.

I have, &c.

(signed) *Thomas Page.*

John Thornborrow, Esq.
&c. &c. &c.

Sir,

Sir, Whitehall Yard, 12 January 1856. Appendix, No. 2.

On the bills for extras on the works of the New Westminster Bridge sent to the Board by the official assignee, and referred to me in your letter of the 1st January, I beg leave to state, that I have conferred with Mr. Rolt, one of Mr. Mare's sureties, and with Mr. Campbell, the manager for the assignees, and am proceeding, in conjunction with Mr. Graham, the resident engineer, with an examination of the quantities, &c., to enable me to report to the Chief Commissioner. One of the accounts, amounting to 968 *l.* 15 *s.*, as rent of wharves, is a matter which is altogether of a legal nature, and I therefore return it.

In the course of conversation on these matters, Mr. Rolt informed me that the assignees had made an offer to the Board proposing to give up the contract, with all the plant, &c., for a certain sum; but I should not now refer to this offer, but for the circumstance, that in recommending any allowance in the shape of extras to the contractors, it might become a question whether it would not be advantageous in expediting the progress and completion of the work that some arrangement of the kind should be made which would leave me at liberty to push forward the several works with that despatch which the importance of Westminster Bridge demands.

In order to avoid embarrassment to the department, and to allow the assignees a fair opportunity of showing what progress could be made under their management, I have forborne to recommend that the powers conferred by the contract for taking possession of the plant and proceeding with the work under the authority of the Board should be put in force, and I was disposed to wait for instructions upon this subject; but the slow progress which has been recently made, and the necessity which I feel that the affairs of the bridge should be placed on a satisfactory footing, induce me to lay before you, for the information of the Chief Commissioner, the following remarks, regarding which I must apologise for referring to past circumstances bearing upon the present state of things.

The building of Westminster Bridge in such a manner as to preserve sufficient space for the navigation under the arches, and to provide for the land traffic over the bridge, was a problem which attracted great interest in the Committee of the House of Commons, which investigated and approved the measure.

Independently of the economy in time and money which was to be effected by a temporary bridge, and by which a sum of 50,000 *l.* was saved to the country, it was evident that if the interest of the Port of London was to be regarded in building the bridge, and providing for the flow of the tide, the mode of construction by cofferdams was inadmissible, and the method I proposed to the late Chief Commissioner had this advantage, that it provided for the flow of the tidal water with the least possible obstruction, and it avoided the expense of cofferdams. It is not irrelevant to mention a fact, as conveying an idea of this expense, that in the late repairs of the old bridge, the permanent work of the sheet piling and platforms round the piers for which coffer-dams were used, amounted in the contract to 14,300 *l.*, while the coffer-dams themselves amounted in the contract to 36,492 *l.**

In undertaking the work which, according to my plan, comprised the maintenance and use of the old bridge for the public service until the first portion of the new bridge should be completed, there were of course responsibilities upon me which would have been avoided had a temporary bridge been constructed, but the confidence which the late Chief Commissioner had in the practicability of the work has been fully justified by our operations, every step of which has, as far as engineering goes, been perfectly successful.

I need not impress upon the Chief Commissioner that the responsibility attached to the work has been necessarily increased by the delays which (in some cases unavoidably) have marked the contractor's proceedings, and that the formation of the foundations of the new structure, up to the south line of the old bridge, and the cutting away the old piers and caissons have been a work of great anxiety to me.

All the considerations which bear on the subject lead me, therefore, to submit to the Chief Commissioner that the works should be let to other contractors, who would make such progress as would, if possible, compensate for the past delays, and would secure an early completion of the first portion of the new bridge. I have thought it my duty to ascertain a rate of prices in the event of the present contract being thrown upon the Board, and I anticipate that the work could be so arranged as to secure its completion as economically, and certainly more rapidly, than under the present contract.

I shall prepare myself to give details upon this matter when the Chief Commissioner shall give me instructions, and in stepping out of the usual line in making these suggestions, I hope the importance of the object will be a sufficient justification, and that I shall have the fullest support in bringing to a successful completion a work undertaken under such difficulties, and which so far has been so successful, except from causes over which I have no control.

I have, &c.

Alfred Austin, Esq. (signed) *Thos. Page.*
&c. &c.

* This expenditure, and the lengthening of the piers, was the last of a series of expenses in attempting to make the old bridge secure, which in 36 years amounted to about 200,000 *l.*

Appendix, No. 2.

Sir, Office of Works, &c., 15 January 1856.

I AM directed by the Chief Commissioner of Her Majesty's Works, &c. to acknowledge the receipt of your letter of the 12th instant, on the subject of Westminster Bridge, and to request that you will prepare the details referred to in the last paragraph thereof, and forward them to him with as little delay as possible.

I am, &c.
(signed) *Alfred Austin*, Secretary.

Thos. Page, Esq.

Sir, Office of Works, 16 January 1856.

I AM directed by the Chief Commissioner of Her Majesty's Works, &c. to inform you that he has considered it advisable to have the works of that bridge examined by some eminent engineers; he has therefore directed Mr. Rendel and Mr. Simpson to visit the structure, and to report to him fully upon all points in relation to the contract, the nature of the works, and all matters relating thereto, and to advise as to future proceedings.

I have, therefore, to request that you will put yourself in communication with those gentlemen, and afford them all the information and assistance you can in the prosecution of their inquiry.

I have, &c.
T. Page, Esq. (signed) *Alfred Austin.*

Sir, Whitehall Yard, 27 February 1856.

WITH reference to my letter of the 12th ultimo, stating my opinion that the works of the New Westminster Bridge could be so arranged as to secure their completion as economically, and certainly more rapidly, than under the present contract, and that I would prepare myself to give details upon this matter on receiving instructions from the Chief Commissioner, which instructions were sent me on the 15th ultimo; I beg leave to state that I have conferred with parties on the subject of prices for completing the works of the New Westminster Bridge.

Under the circumstances in which the works are placed, and pending any arrangements which might be in progress with Mr. Mare's assignees, I could only apply to these parties on my own responsibility, explaining to them however the precise object of the application; and as the estimated prices must necessarily be given on the same basis, I stated that the use of all the existing staging, and of all the plant now on the bridge premises, and on the wharves at Lambeth and Battersea, should be considered as available by any future contractor, but that any staging, plant, &c. required beyond, should be provided by the contractor himself.

The contractors, who entered into the subject in a strictly definite shape, are Messrs. Cochrane, of Woodside Iron Works, near Dudley, with whom I have had several communications, resulting in a proposal to undertake the completion of the new bridge.

The time in which they would engage to complete the first part of the bridge ready for use would be 12 months from the receipt of instructions to commence the work, though under favourable circumstances they could accomplish it in 10 months, and they would remove the old bridge and complete the remainder of the new bridge two years after the completion of the first part.

The prices at which they would undertake the work, subject to sureties for the fulfilment of the specified conditions, differ in a slight degree from the contract prices, as will be seen by the following list, which includes the principal items of the work.

The prices are the same for dredging, concrete, brickwork, granite, ashlar, Portland stone, and all the wrought iron work.

They differ from the contract prices in the following items, although, as will be seen by the columns, they do not exceed in the two most important items the prices asked by the assignees of Mr. Mare.

	Messrs. Cochrane's Prices, Materials, and Labour.	Contract Prices.	Prices asked by Assignees.	Messrs. Cochrane's Prices for Labour only.
	s. d.	s. d.	s. d.	£. s. d.
Granite slabs	7 6	6 –	7 –	– 4 6 p' cube foot.
Granite plinth course	6 –	6 9	– – –	– 3 6 „
Bramley Fall Stone	5 –	4 6	– – –	– 2 6 „
Ditto ditto (labour only)	2 6	2 3	– – –	– 2 6 „
Bradford stone landings	4 3	3 4½	– – –	– 2 3 „
English elm piles	6 –	*Less than 27 feet,* 4 6 *Above 27 feet,* 5 6	6 6	– 2 6 „
Cast iron plates	18 8	14 –	– – –	8 – – „
Ditto outer ribs	15 –	14 –	– – –	5 – – „

In the last column are stated the prices for labour at which Messrs. Cochrane would prepare and fix materials already on the ground, or fix those which have been prepared. These prices are important, as bearing upon the value to the Board of the materials on the premises, on which, under the terms of the contract, Mr. Mare has been paid 50 per cent. on account.

The calculation as to the value of these materials stands thus:

			£. s. d.	£. s. d.
22,125 cub. ft.	Granite, dressed	1/6	1,659 6 –	
1,929 „	Granite, undressed	3/	339 7 –	
4,717 „	New Bramley Fall, dressed	1/6	353 15 6	
1,684 „	New Bramley Fall, undressed	2/6	210 10 –	
6,577 „	Old Bramley Fall, dressed	1/6	493 5 6	
4,666 „	Old Bramley Fall, undressed	2/6	583 5 –	
1,775 „	Old Portland, dressed	1/6	133 2 6	
5,448 „	Old Portland, undressed	3/	817 4 –	
879 sup. ft.	Bradford Landings, 9 in. dressed,	1/	43 19 –	
5,974 „	Bradford Landings, 9 in. undressed,	2/3	672 1 6	
1,148 „	Bradford Landings, 15 in. undressed,	3/6	200 18 –	
				5,506 14 –
84 tons	Cast-iron piles	£. 7/0	588 – –	
22 „	Cast-iron pile caps	7/0	154 – –	
339 „	Cast-iron plates	8/0	2,712 – –	
				3,454 – –
	SUPERSTRUCTURE:			
212 tons	Cast-iron work, fixed	£. 2/10	530 – –	
145 „	Cast-iron work, planed and drilled	3/10	507 10 –	
305 „	Cast-iron work partly planed,	4/10	1,372 10 –	
				2,410 – –
168 „	Wrought-iron work, made up,	£. 2/10	420 – –	
338 „	Wrought-iron work, punched,	10/0	3,380 – –	
				3,800 – –
			£.	15,170 14 –

	£. s. d.
There has been already paid on these materials, under certificates	26,608 14 11½
And if they were all fixed in place under the contract, there would be due on completion, including the 10 per cent., now retained on fixed works	26,608 14 11½
Making a Total of £.	53,217 9 11

If fixed in place at Messrs. Cochrane's prices, they would amount, as above stated, to	15,170 14 –
To which add the sum already paid, viz.	26,608 14 11½
Will give the Total cost of these materials £.	41,779 8 11½

This deducted from 53,217*l.* 9*s.* 11*d.*, leaves an amount in favour of the Board of £. 11,438. 1. 0.

Appendix, No. 2.

For ascertaining the quantities to be executed in the completion of the bridge, I have had measurement and calculations made (adding to the contract quantities the extra piling and other work at the rate which has been found requisite in the present portion of the work), and the expense of the work yet to be provided and fixed, would at Messrs. Cochrane's prices amount to - - - - - - - £. 106,875 1 4

To which must be added the roadway, parapet, lamp standards, and painting, at the contract sum of - - - - - - - -	25,444	–	–
Add former account for fixing - - - - - - - -	15,170	14	–
Add the sum already paid on certificates - - - - - - -	57,593	–	10
Would make a Total of - - - - - - - - - £.	205,082	16	2

There was included for contingencies in Mr. Mare's contract the sum of - - - - - - - - - - - -	13,707	4	–
And for maintaining the Old Bridge a further sum of - - - -	5,000	–	–
Making an amount of - - - - - - - -	18,707	4	–
Of this amount he has been paid 9,330 *l.* 12 *s.* 7 *d.*, but as 1,000 *l.* of this would be really due to extra cutting away in foundations of Old Bridge, the sum paid him on these accounts would be - - - -	8,330	12	7
Leaving a balance to have been paid, if he had completed his contract, of - - - - - - - - - £.	10,376	11	5

Out of which he would have paid 6,000 *l.* for the materials of the Old Bridge.

Mr. Cochrane's prices include contingencies, but the sum put down by him for maintenance of the Old Bridge is 2,500 *l.*, without any allowance to the Board for the materials of the bridge, beyond the stone which could be used in the construction of the New Bridge.

The difference to the Board would therefore stand thus:	£.	*s.*	*d.*
To be paid to Mr. Mare - - - - - - - -	10,376	11	5
To receive from him - - - - - - - - -	6,000	–	–
Leaving an amount in favour of the Board as the work now stands, of -	4,376	11	5
There would have to be paid to Mr. Cochrane for maintenance of Old Bridge - - - - - - - - - - -	2,500	–	–
Leaving a balance in the Board's favour of - - - £. on account of the Old Bridge and contingencies.	1,876	11	5
It has been shown that the saving to the Board by Mr. Cochrane's completing the preparation and fixing of the materials would be -	11,438	1	–
And that a further saving in the contingent sum would be produced of	1,876	11	5
Making a Total of £.	13,314	12	5

To set against this would be the contract prices of Mr. Mare on the piling and other works in which those contract prices differ from Messrs. Cochrane's, which would produce an amount of 1,800 *l.*, but as the prices asked by the assignees are equal in the main items to those of Messrs. Cochrane, the saving to the amount above stated would not really be reduced.

It must therefore be concluded that if fair arrangements can be made with the assignees, it would be to the advantage of Government, both in point of time and expense, to arrange with Messrs. Cochrane for the completion of the work.

I anticipate that the Chief Commissioner will find all the particulars requisite for his information in this case contained in this report. The revision and calculation of the quantities without calling in the assistance of a surveyor, and the necessary conferences and communications, have caused a delay in sending in this report, which I would willingly have avoided; but if my recommendation be acted on, viz., to arrange with Messrs. Cochrane for the completion of the work, I have no doubt it will be proceeded with in a manner perfectly satisfactory to the Chief Commissioner.

There is no difficulty to be apprehended in the construction of the work; it is in a state in which the active operations of a few months would make what is called a great show of work, and it would, I anticipate, be completed so as to ensure general satisfaction.

I have, &c.

Alfred Austin, Esq., &c. &c. &c.

(signed) *Thos. Page.*

Sir, Office of Works, &c., 19 March 1856.

I AM directed by the First Commissioner of Her Majesty's Works, &c., to transmit to you herewith, for your information and guidance, copy of a letter which was yesterday written by his direction to Mr. C. Stephenson, of Parliament-street, respecting the works of the New Bridge at Westminster.

I am, &c.

Thomas Page, Esq. (signed) *Alfred Austin*,
Secretary.

Sir, Office of Works, &c., 18 March 1856.

I AM directed by the First Commissioner of Her Majesty's Works, &c., to inform you, that, in consequence of the bankruptcy of Messrs. Mare & Co., the contractors with this Board for the erection of the New Bridge at Westminster, and the desire of the assignees to relinquish that contract, an arrangement has been made with the assignees to the following effect:—

That a surveyor, to be appointed by this Board, shall prepare three Bills, viz.:—

1. For permanent works executed to the satisfaction of the engineer employed by the Board to superintend the erection of the bridge, based on his (the surveyor's) actual measurements, the quantities so ascertained being priced at the contract schedule.

In the case of works so done, but to which no schedule price applies, then the surveyor to affix a price thereto, under the direction of the Board's engineer, who will in such event be guided by the provisions in the contract on that behalf.

2. For materials delivered, so far as the same are approved of by the engineer, valued at their actual worth, or, in other words, at such price as would admit of their transfer to a new contractor without loss.

3. For the plant, the same being computed at its present value for the works, and consequently such as it could be charged at to a new contractor without loss.

And that should the gross amount of these three bills exceed the sum already paid to the contractor, the Board shall recommend to the Treasury the payment of such excess to the assignees and the determination of their contract, the plant and materials becoming of course the property of the Board.

The First Commissioner proposes to appoint you, as the surveyor, to make out the three bills above-mentioned (if you have no objection to undertake that duty), and the assignees have already signified their acquiescence in such appointment.

They have also stated that their resident engineer, Mr. Campbell, will readily give any facility that may be desired in carrying out the arrangement.

Mr. Page, the Board's engineer, will also receive instructions to afford you any information or assistance in his power.

I transmit to you herewith the contract with Messrs. Mare & Co., and I am directed to request that you will inform the First Commissioner whether you are willing to undertake this duty; and if so, that you will at once proceed in the business, and complete the same with as much expedition as possible.

I am, &c.

C. Stephenson, Esq. (signed) *Alfred Austin*,
Secretary.

Engineer's Office, Westminster Bridge,

Sir, 19 March 1856.

I HAVE been informed this afternoon by Mr. Campbell, the manager of the contractor's works at Westminster Bridge, that in answer to an application from the assignees of Mr. Mare for an early day to be named for the discontinuance of the work, Sir Benjamin Hall had intimated that they might be discontinued at the convenience of the assignees, and that in consequence of this, Mr. Campbell considered it advisable to stop the works at once, deeming it fair to the workmen to give them notice before they should have squandered their wages in holiday keeping.

As I have no information from the Board on these communications with the assignees, and as I had this same day urged the progress of certain important work during the holidays, I was most astonished at this proceeding; but without reference to other circumstances, I would request to be informed if the contractors are, during the stoppage of the works, responsible for damage to the piles, gauntrees, and staging in the river: if they are responsible also for obstructions which may be caused to the navigation of the river, and for damage to craft: and if they are chargeable with the maintenance of the old bridge, and those parts of the new structure which are completed and in progress.

I had expected that whatever might be the termination of the present contract, a work of such importance as this, and with the responsibilities attached to it, which relate to the

Appendix, No. 2.

old bridge, would not have been absolutely stopped without arrangements having been made for its immediate resumption, and without due notice to the engineer from the Chief Commissioner himself; so that the importance of proceeding with certain parts of the work might have been represented, and a sufficient force retained for executing them.

The works have been proceeded with day and night, according to the tides, in order to complete the foundations of the piers and abutments; and now, when the spring tides are coming, no progress will be made, while the men who have been accustomed to the work will be scattered, and delay and difficulty incurred before the works can be resumed.

I have, &c.

Alfred Austin, Esq., &c. &c.

(signed) *Thos. Page.*

According to the arrangements made by Mr. Campbell, the men will be paid off at noon to-morrow.

Engineer's Office, Westminster Bridge,
20 March 1856.

Dear Sir,

My letter to Mr. Campbell was communicated to Mr. Newbon, who then went after Mr. Lee, the official assignee. That gentleman having gone to Blackwall, no answer could then be given to the letter; but I trust that some arrangement will be made by the contractors to proceed with those parts of the work which are most required to be placed in a satisfactory state.

Very truly yours,

Alfred Austin, Esq.

(signed) *Thos. Page.*

Mr. Gardiner told me you had sent for me this morning, which I find was during the time I was waiting to see you. I should have gone to you yesterday on the subject of the stoppage, but it was late before I understood how the case stood, and your preference for written communications instead of verbal ones, induced me to write a report, which, as you would see, was a very hurried one.

Sir,

Office of Works, &c., 22 March 1856.

I beg to acknowledge the receipt of your letter of the 19th instant, at a late hour in the evening of that day, in reference to the discontinuance by the assignees of Messrs. Mare of the works at the New Westminster Bridge, and to state that, previously to such letter reaching me, I had already forwarded to you a copy of a letter addressed by the First Commissioner of Her Majesty's Works, &c. to Mr. Stephenson, late on the 18th instant, containing the terms of an arrangement made between the Board and the assignees in reference to the works and materials at the bridge.

I have since submitted your letter to the First Commissioner, who directs me to inform you, in reference to the continuance of the works, or any portion of them, by the Board, that he is advised that no such step should be taken until he is in possession of the works, and the agreement for giving up the contract is fully satisfied. I am also directed to state, that the contractors have not been relieved from their responsibility for damage done to the piles, &c. and for the obstructions to navigation of the river, and that they continue chargeable with the maintenance of the old bridge, and those parts of the new bridge which are completed and in progress.

I am, &c.

Thos. Page, Esq.

(signed) *Alfred Austin,*
Secretary.

Sir,

Whitehall Yard, 26 March 1856.

With reference to your letter of the 19th instant, containing copy of instructions to Mr. Stephenson upon the bills of quantities, &c. to be made out by him of the work executed and materials supplied for Westminster Bridge by the contractor, Mr. Mare, and his assignees, I beg leave to state, that I have, as requested, placed myself in communication with Mr. Stephenson, and placed at his disposal the several drawings of works executed, and measurements made by Mr. Graham; that would enable Mr. Stephenson to satisfy himself upon those quantities which, being in the ground and below low-water mark, he cannot measure from the work itself.

I had also written on the 20th a second Report on the subject of the continuance of the works, in order to avoid loss of time by proceeding with such parts as had been left very incomplete by the sudden suspension of the operations of the assignees; but your letter of the 22d, conveying the decision of the Chief Commissioner against the continuance of any portion of the works by the Board until possession were obtained, and the agreement for giving up the contract fully satisfied, rendered those suggestions unnecessary.

The first intimation which I had of any discontinuance of the work was by a communication from Mr. Graham, that notice was given to the foremen to discharge the men. On further inquiry I learned from Mr. Campbell the particulars which I communicated to you in my Report of the evening of the 19th, which Report was written on receipt of Mr. Campbell's letter, a copy of which is appended.

Considering,

Considering, however, that until I should receive instructions from the Chief Commissioner, I ought not to concur in any cessation of the works, and that it was of importance that certain portions of the work should not be stopped, I wrote a letter to Mr. Campbell, urging that, at all events, some arrangements should be made for progress with those portions in accordance with a previous letter of mine to Mr. Morris, the cashier for the assignees, who applied to me to sanction the Easter holidays. Copies of which letters are hereto appended.

Since I had the interview with you on the 20th instant, I learned that the assignees had permission to discontinue operations at the bridge. I have not communicated with their agents, nor have I had any reply to their letter to Mr. Campbell of the 19th, and I conclude nothing more will be done at the bridge by the assignees beyond the landing of materials named in my letter of the 26th instant.

A quantity of cement, which had been delivered for immediate use, is, I understand, to be returned.

With regard to the responsibility of the works, now that operations have ceased on the part of the contractors, your letter of the 22d, in reply to my inquiry, leaves the responsibility with the contractors; but there are circumstances connected with these works, and with the old bridge, which I ought to bring under the Chief Commissioner's notice, as affecting this responsibility, and the great caution which should be exercised in regard to it.

When Mr. Mare's failure took place, it was thought desirable by the Board Solicitor that the materials on the bridge platforms, on the wharves at Lambeth, and the premises at Battersea, on which money had been paid under the contract, should be placed exclusively in possession of the Board, and, therefore, gatekeepers paid by the Board were appointed in charge at all these places, the locks changed, and keys allowed to the contractors' people for their use, which possession and regulations have existed from the 15th of October last to the present time.

Now, if the permission given to the assignees for the discontinuance of the works should be found to relieve the sureties from their liabilities, would that circumstance and the *quasi* possession of the works by the Board's paid gatekeepers, not be considered as leaving the whole responsibility with the Board; this is a legal point, and may have had due consideration in the arrangements with the assignees.

Then, with regard to the old bridge itself, which has been a subject of anxiety to those who had charge of it so many years, it ought to be borne in mind that the great settlement in the structure which caused the discontinuance of the repairs and of the extension of the piers for adding a breadth of 12 feet to the roadway, took place in one of the repaired piers in 1843, not more than eight weeks after the printing of my third * Letter to the Earl of Lincoln on the subject of the Thames embankment, in a paragraph of which it was stated, that owing to the gradual deepening of the river, it would be found impossible to maintain Westminster Bridge. I mention this circumstance to show that the old bridge, although it has stood so well since the works of the new bridge were commenced, is not to be overlooked in the present proceedings; its piers and caissons have been cut through for the foundations—an element of limiting the opening of the first part of the new bridge to so short a time was to provide for the public traffic without being dependent on the old bridge, and I am of opinion that the same object should have its full weight now.

The navigation of the river, a subject of much difficulty in the arrangements for the work, is the next object of consideration. I had arranged in the specification that No. 1 pier should not be commenced until the other piers were so far advanced as to allow this pier being proceeded with as rapidly as possible, because I would not, until it should be absolutely necessary, deprive the trade on the river of the use of the fourth arch of the old bridge, a very important arch for the navigation. This pier is now in progress, and should be pushed on rapidly, to allow its being completed simultaneously with the other piers. The piles of the staging and gauntrees are subject to accidents from the craft running against them; not many weeks ago the gauntree for the first arch was in danger of being brought down in consequence of its supporting piles being struck by a barge, and the first navigable arch had to be stopped for the repairs; while, about the same time, a barge was sunk amongst the piles of No. 1 pier. There would be no object in giving a list of casualties of this description, my purpose being only to show that the works are liable to them; that an accident might occur which would close the navigable arches on the Middlesex side of the bridge, where it is most important, and that these considerations should have their due influence in measures for expediting the recommencement of the works.

The subject of the dispersion of the men accustomed to the work, which I have briefly noticed in my letter of the 19th instant, is so important that I should not be justified in passing it over with the mere allusion to it which that letter contained.

The effect of such dispersion, both in delaying the progress and increasing the cost of the work, can readily be appreciated by all people conversant with such subjects, and if the works were submitted to general contract, the ideas of contractors as to the expense of completing the under-water portions of the work would vary according to their seeing the men who are familiar with the operations, busily employed upon them, or to their having to refer to drawings and descriptions for the condition of the works below the low-water line.

I have, &c.

Alfred Austin, Esq. (signed) *Thos. Page.*

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* *See* Appendix of Report of Her Majesty's Commissioners for Metropolitan Improvements, 1844. 0.71.

Appendix, No. 2.

Sir, Whitehall Yard, 19 May 1856.

I HAVE received communications from Mr. Rendel and Mr. Simpson, relative to the contract drawings of Westminster Bridge, and the levels of the approaches, from which I conclude they are to report to you upon other matters than the contract with Mr. Mare.

I would therefore suggest that I should be furnished with copies of any instructions to those gentlemen, and with any observations from you, upon those points on which you may wish for information.

I have lent to Mr. Rendel and Mr. Simpson the contract drawings, and given them the levels of the approaches, and have requested them to state what further information they may require; and on my return from Edinburgh, whither I am going relative to the Chelsea Bridge, I will again confer with them, if necessary.

I have, &c.

The Right Hon. Sir Benjamin Hall, Bart., M.P. (signed) *Thos. Page.*
First Commissioner of Her Majesty's Works.

Sir, Office of Works, &c., 19 May 1856.

I AM directed by the First Commissioner of Her Majesty's Works, &c., to acknowledge the receipt of your letter of this date, on the subject of Westminster Bridge, and to inform you that Messrs. Rendel and Simpson have been instructed to report their views upon all points in relation to that bridge; and that they will, of course, communicate with you on the subject, if they should desire information.

I am, &c.

Thos. Page, Esq. (signed) *Alfred Austin*, Secretary.

Woodside Iron Works, near Dudley,

Sir, 19 February 1856.

HEREWITH we beg to hand you a schedule of prices at which we shall be willing to complete the construction of the New Westminster Bridge, based on the quantities handed to us by you, it being understood that the Commissioners are to hand over to us for our use the plant, staging, machinery, and tools now on the site of the works and at Battersea Park, and such yards and premises on which stone or other materials delivered for the bridge are now lying; we to have the use of such tools and premises as long as required for the execution of the works; also, that we shall be provided with a piece of land at Battersea, adjoining the Thames, for the stowage of the whole of the materials forming the old bridge, which land shall remain in our possession for at least three years, if required, after the completion of our contract.

We would undertake to finish the first portion of the bridge ready for use in 12 months from the receipt of your instructions to commence the work. Under favourable circumstances, however, it may be accomplished in 10 months.

We have, &c.

Thomas Page, Esq., C.E. (signed) *Cochrane & Co.*
Whitehall Yard, London.

Woodside Iron Works, near Dudley,

Dear Sir, 19 February 1856.

HEREWITH you will receive our formal tender and schedule of prices for completing the construction of the New Westminster Bridge.

* Afterwards reduced to 2,500 *l.*

You will notice that we have included a sum of * 5,000 *l.* for the removal of the present bridge, the materials becoming our property; and we have also conditioned that the Commissioners will provide us a piece of land on which we can store the materials, so that we may not be compelled to force the sale of them.

We have provided the before-mentioned sum, although we agree with you in thinking that under *favourable* circumstances we might be able to make the whole material defray the cost of pulling down and removal, still the undertaking is hazardous, and we feel we should not be justified in accepting any other terms.

Thomas Page, Esq.
Whitehall Yard, London.

Woodside Iron Works, near Dudley,

Dear Sir, 24 June 1856.

WE have to acknowledge receipt of your letter, dated the 19th instant, and in reply, beg to inform you that we are willing to enter into a contract to complete the works required for the New Westminster Bridge for a lump sum, based on the schedule of prices contained in our letters to you of the 19th and 27th February 1856, but subject to an increase of 5 *l.*

per

per cent., and in accordance with the conditions and in the time named in the said letters, except as regards the reduction in the price of brickwork mentioned in our letter of the 27th February, it being understood that it is to stand as in the schedule, subject to the five per cent. increase. Appendix, No. 2.

With reference to our undertaking to guarantee the foundations already executed for any given sum, we beg to state that we shall be willing to undertake a careful and thorough examination of them for the sum of 500 *l.*, and if it is found necessary to make any alterations or additions, the cost of such to be arranged between us and the engineer prior to their being made.

Of course the year for completing the first portion would necessarily date from the completion of such examination and alterations or additions, if any were required.

We are, &c.

Thomas Page, Esq.
Whitehall Yard, London.

(signed) *Cochrane & Co.*,
per *John Cochrane.*

Appendix, No. 3.

STATEMENT in Answer to Question 655. Appendix, No. 3

Westminster Bridge.

The following statement shows the deviations which have been made from the contract drawings, with their effect upon the contract amount, and the dates when they were arranged.

An alteration in the design of the Surrey abutment, by which three culverts were introduced instead of the two arches. This alteration was suggested by Sir C. Barry to improve the architectural effect, assented to by Mr. Page, and approved by Sir W. Molesworth. It was determined on the 26th July 1854, and would reduce the contract amount by 3,000*l.*

The driving of the bearing piles, instead of screwing them, made a saving of screw points to the amount of 1,290*l.* This alteration took place in July 1854.

The substitution of a through course of granite at the base of the piers, 2 feet 6 inches thick, in place of the iron curb, and the two layers of 9 inch Bradford landings. It was agreed with the contractor that this alteration should be made without affecting the contract amount. It was determined in July 1854.

The substituting for the three large cast iron ribs the ordinary ribs of the bridge. This alteration was made in August 1854, and added 1 foot 4 inches to the available width of the bridge, a quantity equal to $\frac{1}{60}$ of the whole, and therefore gave an increased convenience to the public, while the change will cause a deduction of 1,008*l.* With reference also to this alteration, I considered it desirable for the following reasons, viz., That the great rib on the south side would have caused interference with the carriage traffic when the first part of the bridge should be opened, and again that a difference in the expansion of these ribs, and of the wrought iron ribs in the centre of each arch, might have led to some irregular strains in the structure, and also that it would be desirable to construct all the arched ribs of the bridge on the same principle.

The substituting wrought iron buckled plates for the 4 inch oak planking for the flooring of the roadway. This alteration was made partly by reason of the difficulty experienced in procuring ship oak planking of the required size and quality, and was proposed to be made without any addition to the contract sum, provided part of the diagonal ribs and some of the wrought iron bearers were omitted, which by the adoption of the plates could be dispensed with without detriment to the strength of the roadway. This alteration was determined on, April 1855.

The construction of the piers of solid brickwork, instead of filling the spaces shown by the contract drawings with concrete. This alteration would cause an addition to the contract sum of 696*l.* Arranged, September 1854.

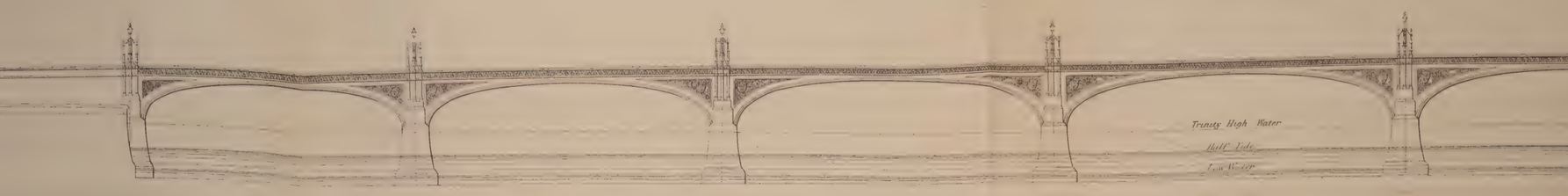
The balance of these deviations would be a sum of 4,602*l.* in reduction of the contract amount.

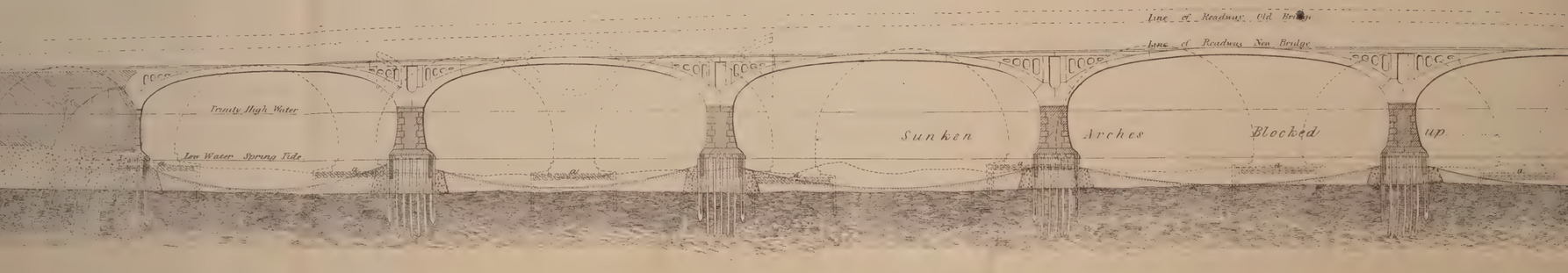
The extra piling and dredging, &c., being dependent upon the ground, and not deviations from the specification, are not set forth in the list.

NEW WESTMINSTER BRIDGE.

ELEVATION, LONGITUDINAL SECTION - SHEWING THE FOUNDATIONS AND PLAN SHEW
PROGRESS OF THE WORKS.

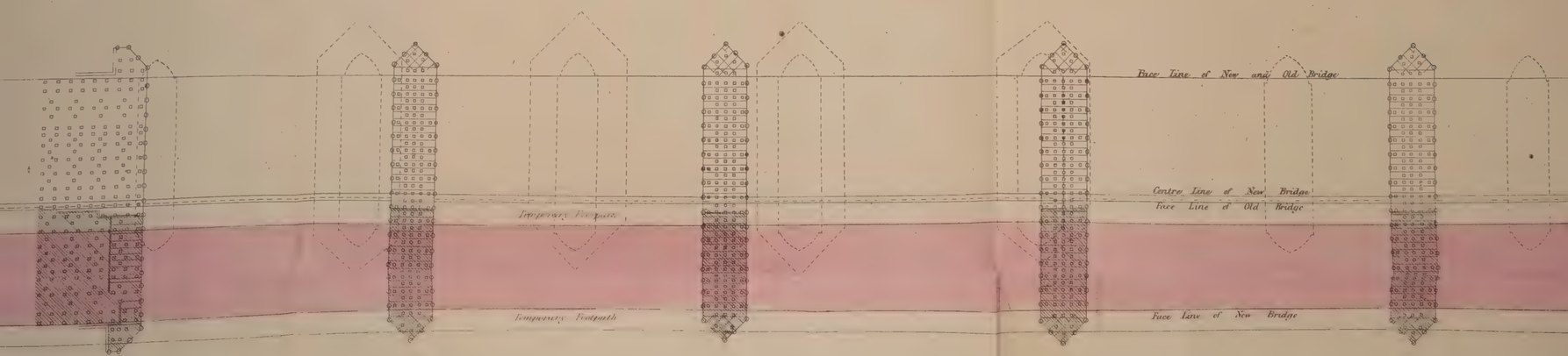
[REFERRED TO IN Mr PAGE'S MEMr TO THE SELECT COMMITTEE OF THE HOUSE OF COMMONS, J





Longitudinal Section shewing the foundations of the New Bridge and the upper surface of the London

The dotted lines shew the Arches and Roadway of the Old Bridge - and
The etched lines a . a . a shew the Caissons of the Old Piers.


Face Line of New and Old Bridge
Centre Line of New Bridge
Face Line of Old Bridge
Temporary Footpath
Temporary Footpath
Face Line of New Bridge

Plan Shewing the progress of the work of the New Piers and Abutments with the width of the first part of the Bridge to

The part to be first opened for the Public Traffic is tinted Lake.

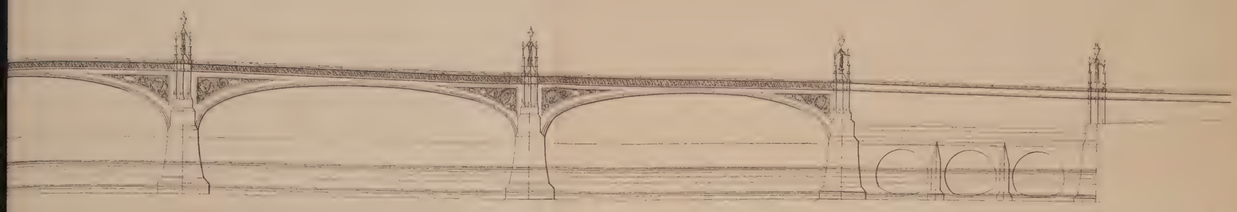
Scale of Feet.

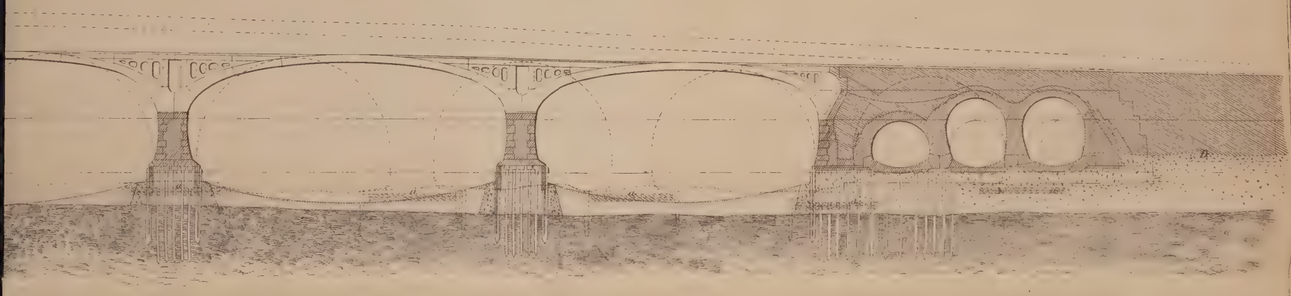
PLAN, Nº 1.

NG THE

1856.

Width of Bridge outside of the Parapets ... 85 : 0
do ... do ... inside ... do ... 83 : 0
Width of each Footpath ... 15 : 0
Width of each Carriage way ... 26 : 0
The Level in centre part of the New Bridge will be 10 feet lower than the Roadway of the Old Bridge.

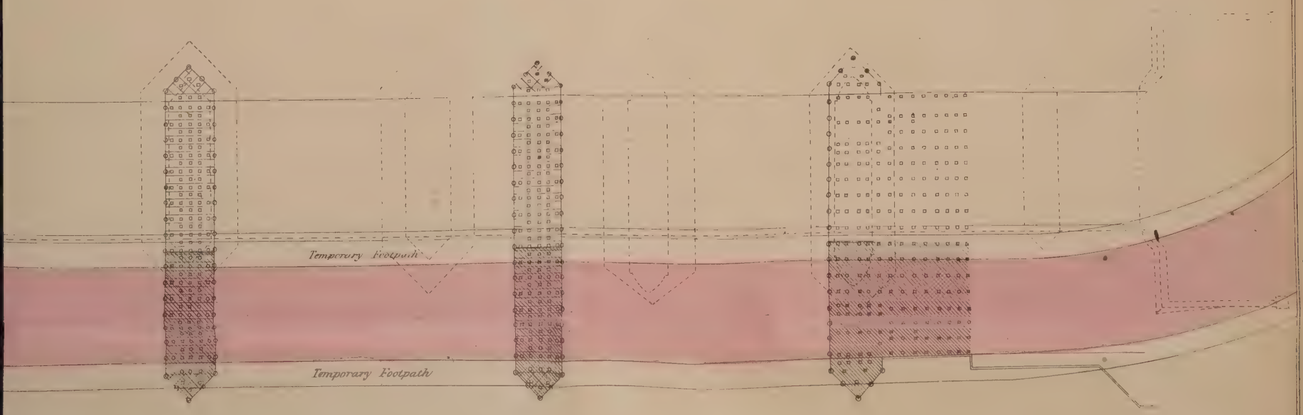




lay.

SURREY ABUTMENT

The dotted line C.D, shews the present bed of the River.
The continuous line, shews the proposed bed, giving 12 feet water at Low Tides, or, 30 feet depth below Trinity Datum.



pened to the Public.

33 Feet of the New Bridge can be completed and opened for Public traffic in 12 Months, from the date of recommencement, at a cost, including temporary footpaths of £34,500. the old Bridge could then be removed, and the remainder of the New Structure be completed in 2 years from the time of opening the first part of the Bridge.

Tho. Page
23 July 1856

Nº389. Ordered, by The House of Commons, to be Printed, 23rd July 1856.
Henry Hansard, Printer.

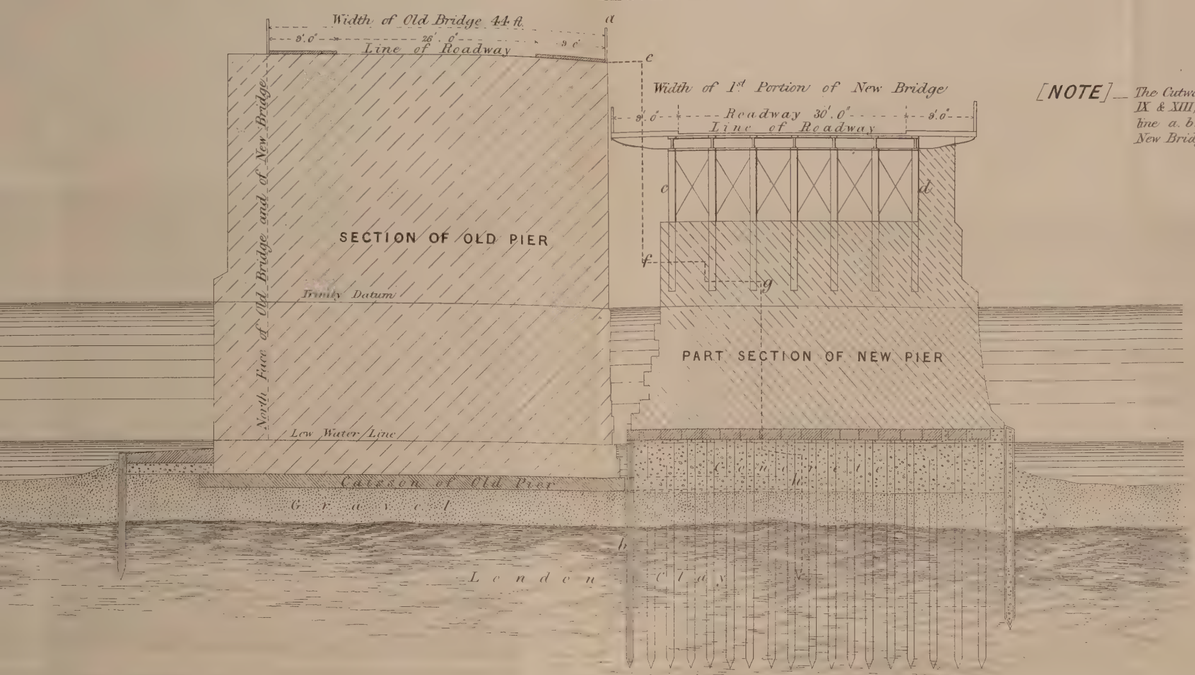
WESTMINSTER BRIDGE.

Section showing the Foundations of the Old Pier Nº VII, and of the New Pier Nº III. and the extent of the Old Pier cut away for the formation of the New Pier.

[Referred to in Mr. Page's Mem.m to the Select Committee of The House of Commons, July, 1856.]

SCALE OF FEET

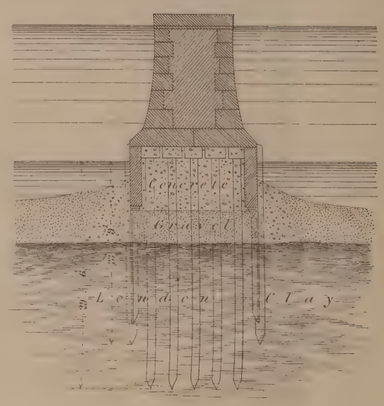
FIG. Nº 1.



[NOTE]— *The Cutwaters and Caissons of the Old Piers III, VII, IX & XIII, on line e f g h. are cut away to the line a. b. and the Iron and Timber Piling of the New Bridge is completed to the line a. b.*

FIG. Nº 3.

CROSS SECTION OF PIER OF NEW BRIDGE.

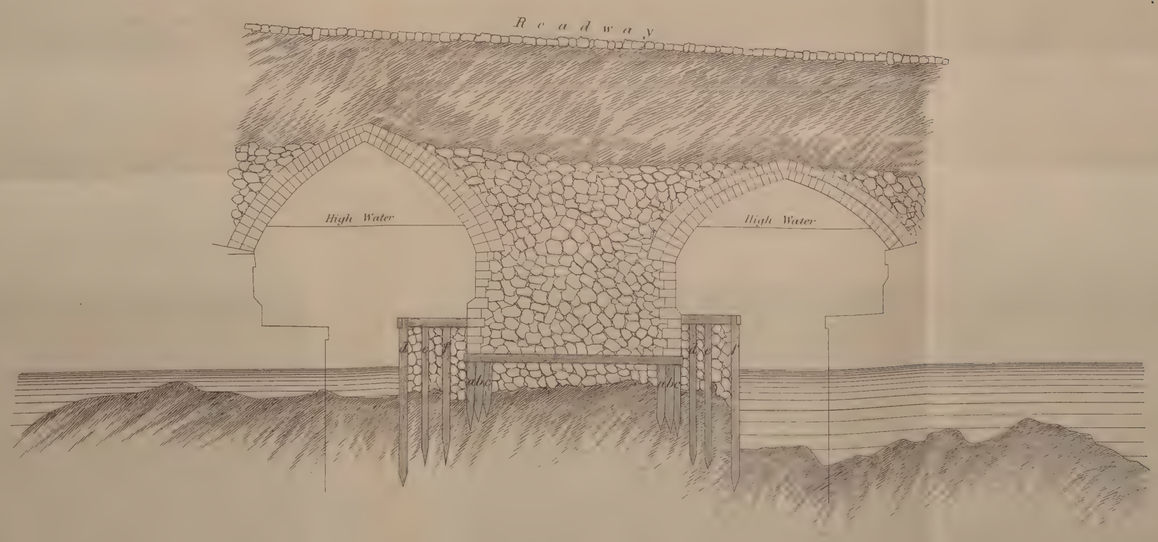


Tho. Page
23 July, 1856

FIG. Nº 2.

SECTION OF THE FIFTH SOUTH PIER AND STARLING OF THE OLD LONDON BRIDGE;
showing its mode of Construction, taken in July, August & Sept.r, 1828.

[Referred to in Mr. Page's Mem.m, 23rd July, 1856.]

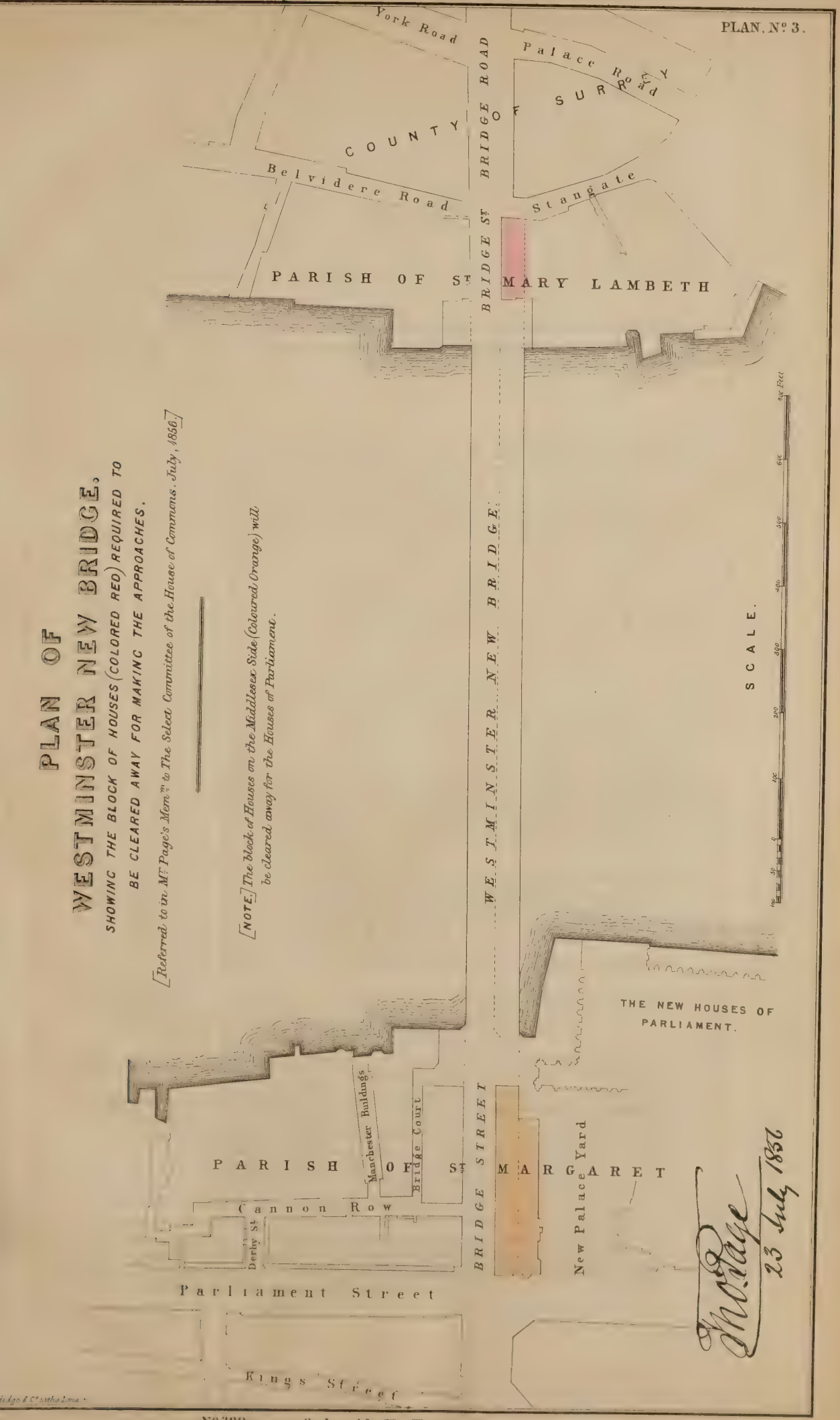


Scale of 10 5 0 20 30 40 50 *Feet.*

Nº389. Ordered, by The House of Commons, to be Printed, 23rd July 1856.

Henry Hansard Printer

PLAN. Nº 3.



Nº 389. Ordered, by The House of Commons, to be Printed, 23rd July, 1856.

Henry Hansard, Printer.

I N D E X.

[*N. B.*—In this Index the *Figures* following the Names of the Witnesses refer to the Questions in the Evidence, and those following *App. p.* to the paging of the Appendix.]

A.

ADVANCES TO CONTRACTOR. According to the contract with Mr. Mare, ninety per cent. of the works executed were to be paid for every six weeks; witness certifying as to the amount executed, *Page* 36–39. 49.

Circumstance of witness, in August or September, having declined to accede to an application by Mr. Mare, for advances of money beyond those to which he was by contract entitled, *Sir B. Hall* 449.

Approaches. Statement by Mr. Page as to the large excessive sum put down by Messrs. Rendel & Simpson for the cost of approaches, *App. p.* 89.

Arches. Reduction in the span of the central arch of from 125 to 120 feet, as compared with the plan laid before the Select Committee of 1853, *Page* 13–16. 72–79. 101–108—— Slightness of the deviation from the plan, *Fowler* 626.

Advantage of fewer arches, and the use of cofferdams, *Stephenson* 677. 680, 681. 706, 707——If there were but three arches there would be no difficulty in regard to the headway, or the inclination over the bridge, *ib.* 706, 707.

Assignees of Mr. Mare. From the bankruptcy of Mr. Mare in September 1854, till the 19th March following, the works were carried on by the assignees without interruption, *Austin* 176–178——Letter from the First Commissioner of Works to the Lords of the Treasury, dated 23 February 1856, on the subject, more especially of pending negociations with the assignees, *ib.* 182——Report of Messrs. Rendel & Simpson, whose counsel in the matter was taken by the Chief Commissioner, dated 21 February 1856, reviewing the work performed and the money advanced, and suggesting the offer of certain terms to the assignees, failing the acceptance of which the works to be taken possession of by the Board of Works, *ib.* 184.

Acceptance eventually of the proposition for a valuation of the work done, of materials delivered, and of the plant, and for the payment to the assignees of any surplus which might appear beyond the amount already paid to the contractors, *Austin* 185, 186. 204——The works are still in the hands of the assignees, the report and valuation of Mr. Charles Stephenson not having yet been acted upon, *ib.* 190–192.

Refusal at first of witness to take the contract out of the hands of the assignees, *Sir B. Hall* 449.

Remarks on sundry letters from Mr. Page to the Board of Works with reference to the works being undertaken by the assignees, and containing suggestions as to the terms, *App. p.* 94 *et seq.*——*See* also *Suspension of Works.*

Austin, Alfred. (Analysis of his Evidence.) Secretary, since November last, to the Board of Works, 1. 7——On the transfer of Westminster Bridge to the Board by the Act of 1853, steps were at once taken to obtain a contract for the building, 2–4——The specifications were prepared by Mr. Page, 5——The works were suspended in March last, 8.

[Second Examination.]—Negotiations between the assignees of Mr. Mare and the Board of Works, which led to the stoppage of the works of the bridge, 172 *et seq.*—— The first application for the suspension of the works emanated from the assignees, 175. 179–182——From the bankruptcy of Mr. Mare, in September, till the 19th March, the works were carried on by the assignees without interruption, 176–178.

Letter from the First Commissioner of Works to the Lords of the Treasury, dated 23 February 1856, on the subject, more especially, of pending negociations with the assignees of Mr. Mare, 182——Report of Messrs. Rendel & Simpson, whose counsel in the matter was taken by the Chief Commissioner, dated 21 February 1856, reviewing the work performed and the money advanced, and suggesting the offer of certain terms to the assignees, failing the acceptance of which the works to be taken possession of by the Board of Works, 184.

Report, 1856—*continued.*

Austin, Alfred. (Analysis of his Evidence)—*continued.*

Acceptance eventually of the proposition for a valuation of the work done, of the material delivered, and of the plant, and for the payment to the assignees of any surplus which might appear beyond the amount already paid to the contractors, 185, 186. 204 ——Report of Mr. Charles Stephenson, dated 14 June 1856, valuing the permanent works, materials, and plant at 85,009 *l.* 1 *s.*, 187–189——The works are still in the hands of the assignees, the report of Mr. Stephenson not having yet been acted upon, 190–192.

Verbal communications between the Chief Commissioner and Messrs. Rendel & Simpson, which led to an official letter to those gentlemen, dated 31 March 1856, requesting them to report upon the cost and progress of the works, and the desirability or otherwise of proceeding with the original scheme of construction; this letter read, 193–202——In the earlier part of January witness was told by the Chief Commissioner that the bridge was not in a satisfactory state, and by his direction wrote to Mr. Page, on 16 January, with reference to an examination of the works by Messrs. Rendel & Simpson, 204, 205.

B.

Bankruptcy of Contractor. See *Assignees of Mr. Mare.* *Suspension of Works.*

Bed of the River. See *Foundations.* *Scour of the River.*

Blackfriars Bridge. Subsidence of Blackfriars Bridge, notwithstanding that it has bearing piles, *Rendel* 211. 213. 265, 266——Probable effect of the increased scour of the river, as well as of the piles, in causing subsidence, *Simpson* 248, 249. 253——The piling was excellent, *ib.* 251.

Blackwall Wharf. Formation of the Brunswick Wharf at Blackwall, with cast-iron piles and plates, backed with concrete, *Page* 27. 95. 129–132——Want of analogy between the Blackwall Wharf and the bridge, *Rendel* 258–262.

Board of Works. See *Inquiry and Report* (*Messrs. Rendel & Simpson*). *Instructions to Messrs. Rendel & Simpson.* *Plan.* *Suspension of Works.*

Booms. Inexpediency of booms as a protection to the piers, *Stephenson* 345——There is no necessity for the use of booms, *Hawkshaw* 538——Belief that booms or fenders were not contemplated in the plan, *Fowler* 618–620.

Brickwork. The spaces in the piers will be filled up with brickwork instead of with concrete, as according to the specifications, *Page* 651.

C.

Calder Bridge. Construction by witness of the railway bridge over the Calder in two halves united as one bridge at the pier as well as the roadway, *Hawkshaw* 536, 537.

Cast-iron Piles. See *Iron Piles or Casing.*

Cement. See *Concrete.*

Chelsea Bridge. Similar principle in the case of the Chelsea Bridge as in the plan of the bridge at Westminster, *Page* 27, and *App. p.* 84.

Cochrane, Messrs. Willingness of Messrs. Cochrane, of Woodside Iron Works, to contract for the removal of the old bridge and the entire completion of the new bridge in two years from the time of the first part being open to the public, *Page* 161.

Letter from Mr. Page to Mr. Austin, dated 27 February 1856, with reference to the undertaking of the works by Messrs. Cochrane, and stating their prices for labour, &c., *App. p.* 96–99.

Letters from Messrs. Cochrane & Co. to Mr. Page, dated 19 February 1856, and 24 June 1856, offering to contract, on certain terms, for the completion of the bridge, *App. p.* 102, 103.

Cofferdams. Sundry particulars relative to certain bridges, the foundations of which have been constructed without the use of cofferdams, *Page* 27–34. 95. 113–132; and *App. p.* 91, 92.

Argument that the piers should be founded within cofferdams; these, moreover, would be especially useful in removing the foundations of the old bridge, *Rendel* 211. 228, 229. 254–257. 272–276. 280–284. 304. 310–312——Use of cofferdams in building the piers of Blackfriars Bridge and widening the piers of Westminster Bridge, *Simpson* 250–253 ——The whole area to be disturbed should be enclosed within cofferdams, *Rendel* 280, 281——Probable increase of time and expense if cofferdams be resorted to, *ib.* 311—— Cofferdams are not necessary in the construction of all bridges, *ib.* 319.

Report, 1856—*continued.*

Cofferdams—continued.

Opinion that it would have been much better if, from the first, cofferdams had been used; they may, in fact, still be necessary, *Stephenson* 402. 417. 447. 448——If money were no object, it doubtless would be better to make use of cofferdams, and to build with granite, *Hawkshaw* 475–480. 543, 544——Less expedition when cofferdams are used, *ib.* 554——Impracticability of cofferdams in the present case on account of the spans of the arches being limited to 120 feet, *Stephenson* 677, 678——Cofferdams would be perfectly applicable in building a new bridge; but by their use the building would occupy five years, *Simpson* 709.

Reasons adduced by Mr. Page for dispensing with cofferdams, *App. p.* 82, 83.

Commencement of Works. On the transfer of Westminster Bridge to the Board by the Act of 1853, steps were at once taken to obtain a contract for the building, *Austin* 2–4——The bridge was commenced in July 1854, but, for some reasons, the contract was not signed till the October following, *Page* 44–47.

Completion of Bridge. If the bridge were required for a railway it would probably be finished in two years, *Hawkshaw* 552–554. 595——Remarks by Mr. Page with reference to the time in which the whole may be completed, *App. p.* 90.

See also *Cochrane, Messrs.* *Progress of Works.*

Concrete. Objection to a deposit of concrete outside the iron casing, as a means of preventing the river from deepening its bed close to the piers, *Rendel* 211–215. 291–295. 303, 304. 316, 317——If the gravel be scoured away the concrete would begin to break up, *ib.* 292–294. 298——It is not necessary in all cases to dispense with concrete, *ib.* 320.

Adequacy in the main of a protection of the piers by a deposit of concrete after dredging between the arches, *Stephenson* 409, 410——Excellent quality of the concrete used by Mr. Page, *Hawkshaw* 573. 586; *Fowler* 622; *Stephenson* 689——Inadequacy, probably, of piers consisting merely of a column of concrete or brickwork without cylinders, *Hawkshaw* 592–594.

See also *Foundations.* *Piers.*

Contract. See *Advances to Contractors.* *Assignees of Mr. Mare.* *Cochrane, Messrs.* *Cost.* *Suspension of Works.*

Cost. Estimate that about 57,000 *l.* worth of material would be available from the old bridge and new bridge if the alterations recommended by witness were adopted, *Rendel & Simpson* 286–290.

Comparison by Mr. Page of the cost of the bridge proposed by Messrs. Rendel & Simpson, and of that in course of execution, *App. p.* 89, 90.

See also *Approaches.* *Cofferdams.* *Deviations from Plan.*

Cylinders. Many bridges have been constructed upon iron cylinders, on principles analogous to those of the present plan, *Hawkshaw* 591. 607; *Page* 27. 119–128——Construction by Mr. Brunel and Sir W. Cubitt of bridges with cylinders and concrete, *Page* 27. 119–128——Objection to the use of cylinders in the piling for the foundation, *Stephenson* 390, 391——Security in constructing with cylinders, though inferior to the present plan, *Hawkshaw* 591. 607.

D.

Deviations from Plan. Deviations not material, made from the plan since the signing of the contract, *Page* 96–100——Power of the engineer to make deviations from the specifications; expediency thereof, *ib.* 162–170. 648. 652——There is no deviation of any material character from the original design, *Fowler* 624–646——Further evidence as to the extent of the deviations; belief that they are all improvements, *Page* 647–655——Terms of the contract in regard to deviations from the specifications, *ib.* 756, 657.

Further statement by Mr. Page, showing the deviations which have been made from the contract drawings, with their effect upon the contract amount, and the dates when they were adopted, *App. p.* 90, 91. 103——The balance of the deviations would be a sum of 4,602 *l.* in reduction of the contract amount, *ib.* 91. 103.

See also *Arches.* *Screw or Driving Piles.* *Width.*

Divers. Inexpediency of depending upon divers for the fastening of the iron ties and the jointing of the cast-iron plates, *Rendel* 257. 310.

Adequacy of divers as a means of seeing to the security of the work, *Stephenson* 679. 680.

Dredging. Letter from the City Remembrancer to Sir B. Hall, dated Guildhall, 17 July 1856, in which it is represented that the piers of any new bridge at Westminster should be built at such a depth as to admit of dredging in the vicinity of the bridge to the extent of thirty-five feet below the level of Trinity high water mark, *App. p.* 77.

See also *Scour of the River.*

Report, 1856—*continued.*

Durability. If the bridge endure for 100 or 150 years, as it certainly will do, without requiring material repairs, witness would consider it practically permanent, or at least sufficiently so for the requirements of the case, *Hawkshaw* 457. 467–471. 487. 550–552. 564——The bridge would last at least for 150 or 200 years without requiring material repairs, and would practically be as permanent as a granite bridge, *Fowler* 494–496. 505, 506. 540–542.

See also *Cofferdams.* *Concrete.* *Foundations.* *Iron Piles or Casing.* *Lateral Sections.* *Piers.* *Strength.* *Timber Piles.*

E.

Expansion. See *Superstructure.*

Extra Work. Stipulation in regard to payment for extras, *Page* 40–43——Remarks by Mr. Page, in letter dated 12 January 1856, upon the bills for extras, as sent to the Board of Works by the official assignee of Mr. Mare, *App. p.* 95.

F.

Foundations. The general plan in the specifications, as regards the foundations, is in principle the same as the plan explained to the Committee of the House of Commons, *Page* 17–19. 109, 110——Such plan explained, *ib.* 27, 95. 120–139.

Grounds upon which Mr. Simpson and witness concluded that the mode of construction of the piers below water was defective, and rendered the foundations liable to subsidence, *Rendel* 210 *et seq.*——Necessity of granite piers in order to ensure unquestionable security and permanence, *ib.* 211–215, 256, 257. 272 *et seq.* 308. 317——Inexpediency of depending upon concrete or other extra precautions, to be adopted from time to time as a means of securing permanency, *ib.* 213, 214. 292–295. 316, 317——Under special circumstances only should either sheathing or bearing piles be driven or screwed into the London clay, *ib.* 225. 238.

Anticipated tremulous motion of the piles, and consequent bad effect, *Rendel & Simpson* 255, 256——Concurrence generally in Mr. Rendel's evidence as to the defects of the proposed construction of the foundations, and the necessity of piers of solid masonry founded in the London clay, *Simpson* 271. 278——Views of Mr. George Rennie and Mr. Walker in favour of carrying the piers deep into the London clay, *Rendel* 277——Objection to founding the iron piles upon gravel, *ib.* 309.

There would practically be no great difficulty in regard to the lower plates reaching a solid bed in the clay, *Stephenson* 346–349——The piles may be driven through gravel into the London clay without any serious or injurious result, *ib.* 364–367. 376–380——Security in founding upon Thames gravel if kept in place by the piles, *ib.* 364–367. 392, 393——The London clay when once reached in the borings of the bridge extends to a considerable depth, *ib.* 386–389——Had the design rested with witness he would have laid the foundations deeper and more permanent, *ib.* 416–418.

It is perfectly practicable to ensure safety by the present mode, and the work has in fact been exceedingly well done, *Hawkshaw* 476. 481——Concurrence with Mr. Hawkshaw as to the general security and sufficiency of the bridge, *Fowler* 608——On further consideration and inspection, witness concludes that the present design may with safety be proceeded with, *Stephenson* 674. 675. 689, 690.

General description by Mr. Page of the intended structure, with reference specially to its strength and durability, *App. p.* 80–82——Sundry bridges on the Continent in which timber-bearing piles and concrete encased in timber have been used, *ib.* 83. 91, 92——Instances of the employment of cast-iron as an outer casing, with brickwork or concrete, *ib.* 83, 84. 91, 92.

See also *Cofferdams.* *Concrete.* *Durability.* *Iron Piles or Casing.* *Lateral Sections.* *Piers.* *Scour of the River.* *Site.*

Fowler, John, (Analysis of his Evidence.)—See *Hawkshaw, John, &c.*

G.

Granite Piers. See *Cofferdams.* *Foundations.* *Piers.*

Granite Plinth Course. The granite course should certainly commence at the lowest low-water mark, *Stephenson* 358–363——Advantage if the piles were more under low-water mark, and if there were a broader face of granite, *Hawkshaw* 522. 538. 567, 568. 600–605——Mode in which the course of granite on the top of the piles might be carried out; the blocks should project beyond the piles, so as to act as a fender, *ib.* 568. 600–603——Height and thickness of the granite slabs, *ib.* 580. 587–590.

A projection or platform of granite is very desirable as a protection to the piles; this, though not provided for in the plans, may yet be done, *Fowler* 608–617. 621——Modification

Report, 1856—*continued.*

Granite Plinth Course—continued.

Modification suggested in regard to the granite plinth, so as to avoid inequality of pressure, *Stephenson* 681, 702.

Substitution of a large granite plinth course for the cast-iron curb round the pier; deviation hereby from the original plan; *Page* 648——Statement by Mr. Page as to the facility of carrying out a granite course, though not likely to be called into use, *App. p.* 87.

Gravel. See *Foundations.*

H.

Hall, Right Hon. Sir Benjamin, Bart. (Analysis of his Evidence.)—Circumstance of witness in August or September having declined to accede to an application by Mr. Mare for advances of money beyond those to which he was by contract entitled, 449——Refusal at first of witness to take the contract out of the hands of the assignees of Mr. Mare, *ib.*——Attention of witness first drawn to the state of the bridge on the 7th January, *ib.*——Communication thereupon with Mr. Rendel and Mr. Simpson, and on the 16th January with Mr. Page, adverted to, as showing that witness lost no time in acting in the matter, *ib.*

Hawkshaw, John, and Fowler, John. (Analysis of their Evidence) (*Mr. Hawkshaw.*)—Has examined the drawings for the piers of the new bridge, and also the work already done, 450-453——Ample strength of the piers to resist the weight of the superstructure, 454-456. 472. 563-567——Great durability of the piers; the internal works may be considered almost indestructible, 457. 465-468. 564——Very considerable durability anticipated in regard to the cast-iron casing; experiments of Mr. Mallett, of Dublin, adverted to hereon, 457-467. 513-515. 573. 577.

If the bridge endure for 100 or 150 years, without requiring material repairs, witness would consider it practically permanent, or at least sufficiently so for the requirements of the case, 467-471. 487. 550-552——On the decay of the iron casing, fresh casing or plates can easily be applied, 467. 539——Though granite piers, founded within cofferdams are most durable as piers, they are not expedient on account of the expense, 469-471.

(*Messrs. Hawkshaw & Fowler.*)—Improbability of so great an increase in the scour of the river as injuriously to affect the foundations of the piers, 473. 474. 496-499. 561, 562. 623——(*Mr. Hawkshaw.*)—If money were no object, it doubtless would be better to make use of cofferdams, and to build with granite, 475-480. 543. 544——It is, however, perfectly practicable to ensure safety by the present mode, and the work has in fact been exceedingly well done, 476. 481.

Witness does not apprehend any difficulty or insecurity on account of the foundations of the old bridge in putting in the piers at twice, 482-486. 525. 531. 555-560——He decidedly objects to the suggestion, that the piers should be built in separate and distinct parts, with a connexion at the roadway, 483-486. 556——On the whole, he sees no reason for not proceeding with the bridge as at present designed and commenced, 487. 596-598.

(*Mr. Fowler.*)—Has examined the plans of the bridge, and concurs generally with Mr. Hawkshaw as to their adequacy, 488 *et seq.*——Considers, moreover, that the permanence of the bridge would not at all be affected by the corrosion of the iron casing, inasmuch as before the decay of the casing the river will have assumed a permanent form, and there will be no scour which can injure the foundations, 489-499. 503-506. 539-542——The bridge would last for at least 150 or 200 years without requiring material repairs, and would practically be as permanent as a granite bridge, 494-496. 505, 506. 540-542.

Adequacy of the timber piles, or of the concrete, to sustain the weight of the superstructure; any unequal pressure on one of the other would not therefore be practically of any consequence, 500-502——Large sectional area of the bridge adverted to, as showing that there will be less tendency to scour than to deposit at that point of the river, 507-509——Concurrence with Mr. Hawkshaw as to the excellent manner in which the work has hitherto been executed, 510, 511. 622.

(*Mr. Hawkshaw.*)—Considerable strength of the iron plates, 516-518——Avoidance of injury to the plates in their being kept below low water, 519-522——Advantage if the piles were more under low water, and if there were a broader face of granite, 522. 538. 567, 568. 600-605——Explanation of the mode in which the two halves of the bridge are proposed to be united, 523-530——There is no necessity for the use of booms, 538——The headway of twenty feet might without difficulty be increased to twenty-five feet, 545-549——If the bridge were required for a railway, it would probably be finished in two years, 552-554. 595——Less expedition when cofferdams are used, 554.

Report, 1856—*continued.*

Hawkshaw, John, and Fowler, John. (Analysis of their Evidence)—*continued.*

The iron casing is not intended to act in conjunction with the pier as a support of the superstructure, 565, 566——Facility for replacing the iron casing if more separated from the superstructure by a course of granite, 567——Mode in which the course of granite on the top of the piles might be carried out; the blocks should project beyond the piles so as to act as a fender, 568. 600–603——Size and arrangement of the iron piles and the plates adverted to, as showing that they would probably be subject to corrosion on the inner as well as the outer side, 569–577.

Excellent quality of the concrete used by Mr. Page, 573. 586——Height and thickness of the granite slabs, 578, 579——Fair share of the weight borne by the granite slabs, 580. 587–590——Present condition of several of the piers; there is only one where the concrete is completed to the top, 582–586——Construction of several bridges on principles analogous, though not exactly similar, to the plan of Mr. Page, 591. 606, 607——Security in constructing with cylinders, though inferior to the present plan, 591–607——Inadequacy, probably, of piers consisting merely of a column of concrete, or brickwork, without cylinders, 592–594.

Though witness sees no sound reason for stopping the works on account of the mode of construction he considers some detailed alterations of the piers very desirable, 596–605——He has not considered the question of the superstructure, 602–604——(*Mr. Fowler.*)—Concurs with Mr. Hawkshaw as to the general security and sufficiency of the bridge, 608——Considers, however, that a projection or platform of granite is very desirable as a protection to the piles; this, though not provided for in the plans, may yet be done, 608–617. 621——Belief that booms or fenders were not contemplated in the plan, 618–620——Good character of the concrete, 622.

Evidence to the effect that there is no deviation of any material character from the original design, 624–646——Slight deviation in the span of the arch, 626——The substitution of driving piles for screw piles is immaterial, and cannot be considered an alteration of design, 628–631. 644——The gradients and the headway, and not the construction, were the main points inquired into by the Select Committee of 1853; 639–642. 646.

Headway. The headway remains the same as was decided upon in the Committee of 1853; *Page* 78, 79. 101–104——The headway of twenty feet might without difficulty be increased to twenty-five feet, *Hawkshaw* 545–549.

Letter from the City Remembrancer to Sir B. Hall, dated Guildhall, 17 July 1856, in which objection is raised to any new bridge at Westminster, the arches of which may be less than twenty-five feet above Trinity high water-mark, *App. p.* 77.

Hungerford Bridge. Circumstance of the Hungerford Bridge piers being built on gravel, protected by sheet piling; approval thereof, *Stephenson* 700, 701.

I.

Inquiry and Report (*Messrs. Rendel & Simpson.*) In the earlier part of January witness was told by the Chief Commissioner that the bridge was not in a satisfactory state, and by his directions wrote to Mr. Page on the 16th January, with reference to an examination of the works by Messrs. Rendel & Simpson, *Austin* 204, 205; and *App. p.* 96——In consequence of previous communication with the Office of Works, Mr. Simpson and witness drew up a report, dated 28 June 1856, upon the scheme of construction of the bridge, *Rendel* 206–209——Attention of witness first drawn to the state of the bridge on the 7th January, by a person in whose experience he has great confidence, *Sir B. Hall* 449——Communication thereon with Mr. Rendel and Mr. Simpson, and on the 16th January with Mr. Page, adverted to, as showing that witness lost no time in acting in the matter, *ib.* 449.

Evidence to the effect that witness understood from Messrs. Rendel & Simpson that the principal reference to them was upon the contract, and that he had not at first any direct official information from the Office of Works that their inquiry was to extend to the plan and construction, *Page* 710 *et seq.*——Though Mr. Simpson stated that he and Mr. Rendel would have to inquire generally into the bridge, witness had not at first the least idea that their inquiries would go to the extent they did, *ib.* 716–720. 726–739. 782–813——Extent of inquiry by them into the construction, before their second instructions in March; the principle of the plan was not then called in question, *ib.* 716–720. 727. 784–795. 802——Witness, in stating that he "had no information as to the object of Messrs. Rendel & Simpson's inquiry," meant to state that he "had no information from the department," *ib.* 721–725——Up to the date of his application in May, he concluded that their inquiries principally related to matters connected with the contract, *ib.* 726–729. 784–795. 802–813.

After the 16th January, Mr. Simpson and witness went over the works with Mr. Page and made inquiries as to all the details of construction, *Rendel* 822–827. 835. 853. 855——Advice given by witness to Mr. Page on sundry questions of construction, before the

Report, 1856—*continued.*

Inquiry and Report (Messrs. Rendel & Simpson)—continued.

the second instructions from the Office of Works, *Rendel* 835, 836. 855. 857, 858——Probability of Mr. Page having become aware, or partly aware, of the extended nature of the inquiry before he was furnished with the instructions, *Rendel & Simpson* 840–842. 846, 847.

Written statement by Mr. Page, containing observations in reply to the report of Messrs. Rendel & Simpson, *App. p.* 77 *et seq.*

Further statement by Mr. Page as to his not having been made cognisant from the first of the extent of the inquiry and the charge against him, *App. p.* 79, 80——Comment upon the private information which led to the steps taken by Sir Benjamin Hall, *ib.* 80.

Instructions to Messrs. Rendel & Simpson. Verbal communications between the Chief Commissioner and Messrs. Rendel & Simpson, which led to an official letter to those gentlemen, dated 31st March 1856, requesting them to report upon the cost and progress of the works, and the desirability or otherwise of proceeding with the original scheme of construction; this letter read, *Austin* 193–202.

Unsuccessful application made by witness on the 19th May to the Department of Works for a copy of the instructions to Messrs. Rendel & Simpson, *Page* 713. 745–747. 769. 773–776——Application subsequently made by witness to Messrs. Rendel & Simpson for a copy of their instructions; extracts from the instructions were given him by Mr. Simpson, which extracts he contends were a private and confidential communication, *ib.* 713–715. 737–781. 798——Witness considered it due to him that a copy of the instructions should be sent to him from the Office of Works, and complains that his treatment by the department was not short of being insulting, *ib.* 777. 798.

With reference to the first communications between the Chief Commissioner and Mr. Simpson and witness, in January, it was understood by witness that inquiry was first to be made into the contract, and on that question being determined, into the structural arrangements and plan, *Rendel* 814–821. 839. 851——It never appeared to witness that his instructions were, as regarded Mr. Page, of a private nature, *ib.* 828——Communication by Mr. Simpson to Mr. Page of the main part of the instructions some time in May, *ib.* 828–831. 844.

Though there was no order from the Office of Works, in regard to the instructions communicated to Mr. Page, witness did not consider that there was any secrecy in the matter, and on consultation with Mr. Rendel a copy was at once given, *Simpson* 832, 833. 861——General character of the first instructions, *ib.* 834.

Explicit and direct instructions required by Mr. Simpson and witness before undertaking a more comprehensive inquiry than at first into the question of instruction, *Rendel* 837, 838. 852. 860——Further statement, that there was no secrecy about the instructions, and that the communications generally with Mr. Page were conducted in a perfectly open way, *ib.* 843–850. 853–859——Witness fully concluded that Mr. Page was entitled to see the instructions, and would not have hesitated about his having them, *ib.* 847–849.

How far the instructions were given to Mr. Page in confidence, *Simpson* 861.

Letter, dated 2d June 1856, from witness to Messrs. Rendel & Simpson, asking for extracts from their instructions, *Page* 861——Letter to Mr. Simpson, dated 16 June, as to witness being permitted to quote the instructions, *ib.*

Mr. Rendel and witness were instructed first to inquire into the contract; the question of construction had previously been submitted to them, *Simpson* 863.

Copy of letter from Mr. Page to Sir B. Hall, dated 19 May 1856, applying for copies of any instructions furnished to Messrs. Rendel & Simpson, *App. p.* 102——Reply thereto by Mr. Austin, dated 19 May 1856, stating that instructions have been given to report upon all points in relation to the bridge, *ib.*

See also *Inquiry and Report (Messrs. Rendel & Simpson).*

Iron Piles or Casing. Objection made on the part of one of the firms which tendered for the contract to the use of wrought-iron piles and plates in the foundation; cast-iron piles and plates were subsequently decided upon, *Page* 26.

It would be better if the iron piles did not act as bearing piles as well as casing piles, *Rendel* 240; *Stephenson* 681. 690, 691——Novelty of the application of cast-iron piles as a shell to the pier, *Stephenson* 321——Certainty of the piles being broken if barges or ice were to strike against them, *ib.* 321. 411–413——Provision against their being broken, inasmuch as they stop at six feet below low water, *ib.* 321. 411. 414——Objection to cast-iron piles as, when exposed to the action of water, not sufficiently durable or permanent, *ib.* 321. 328. 350–353. 368–371. 401.

Result of the experiments of Mr. Mallett, of Dublin, in regard to the corrosion of cast-iron when immersed in the Liffey, *Stephenson* 321; *Hawkshaw* 457–461. 513——Use of cast-iron in wharfing as being, though not permanent, less expensive than solid masonry, *Stephenson* 321——Less permanence of iron piles than of granite masonry, *ib.*

Report, 1856—*continued.*

Iron Piles or Casing—continued.

329. 334——Equal difficulty in replacing iron piles as in replacing masonry, *Stephenson* 330–333——Use of cast-iron piling in the wharf at Fleetwood and the Brunswick Wharf, *ib.* 338–344.

Very considerable durability anticipated in regard to the cast-iron casing; experiments of Mr. Mallett, of Dublin, adverted to hereon, *Hawkshaw* 457–475. 513–515. 573. 577——On the decay of the iron casing, fresh casing or plates can easily be applied, *ib.* 467. 539——Considerable strength of the iron plates, *ib.* 516–518——Avoidance of injury to the plates in their being kept below low water, *ib.* 519–522——It would be better if they were somewhat shorter, *ib.* 522.

The iron casing is not intended to act in conjunction with the pier as a support to the superstructure, *Hawkshaw* 565, 566——Facility for replacing the iron casing, if more separated from the superstructure, by a course of granite, *ib.* 567——Size and arrangement of the piles and the plates adverted to, as showing that they would probably be subject to corrosion on the inner as well as on the outer side, *ib.* 569–577.

On further consideration, witness concludes that the greatest inconvenience which can arise, under the modifications suggested by witness and mainly accepted by Mr. Page, is that the iron piles may in some fifty or one hundred years require replacing, which can readily be done, *Stephenson* 693–698.

Sundry bridges adverted to by Mr. Page as instances of the employment of cast iron as an outer casing, *App. p* 83, 84.

See also *Cofferdams.* *Concrete.* *Durability.* *Foundations.* *Piers.* *Scour of the River.* *Strength.*

L.

Lary Bridge. Course adopted by witness in order to preserve the foundations of the Lary Bridge, *Rendel* 313–315——Particulars by Mr. Page as to the construction being carried out by Mr. Rendel without using cofferdams, *App. p.* 83. 92.

Lateral Sections. Probability of partial settlement if the bridge be composed in halves, the second half to be built upon the site of the present bridge, *Rendel* 216–229——Very precarious and unsafe character of the foundations of the old bridge adverted to as a strong argument against building a portion of the new bridge upon the same site, after the completion of the other portion, *Rendel* 227–229; *Stephenson* 402–404. 423–430. 442–446——It would be better to build two separate bridges or lines of piers, and to connect them at the roadway, *Rendel* 217. 222, 223. 226. 272; *Stephenson* 441–446.

Witness does not apprehend any difficulty or insecurity on account of the foundations of the old bridge, in putting in the piers at twice, *Hawkshaw* 482–486. 525. 531. 555–560——He decidedly objects to the suggestion that the piers should be built in separate and distinct parts, with a connection at the roadway, *ib.* 483–486. 556——Explanation of the mode in which the two halves of the bridge are proposed to be united, *ib.* 523–530.

On further consideration, witness finds that there would be less difficulty than he before stated in building upon the site of the old piers, and that in fact the new bridge may with safety and without partial settlement be built in halves, *Stephenson* 682–688. 708.

Statement by Mr. Page with reference to the construction of the bridge in independent lateral sections; absence of danger in building it as proposed, *App. p.* 87.

London Bridge. Use of a very perfect platform of timber resting on the piles, and binding them together, so as to equalise the weight upon each pile, *Rendel* 254. 300.

London Clay. See *Foundations.* *Scour of the River.*

M.

Mare, Mr. See *Advances to Contractor.* *Assignees of Mr. Mare.*

Modification of Plan. Though witness sees no sound reason for stopping the works on account of the mode of the construction, he considers some detailed alterations of the piers very desirable, *Stephenson* 322–327. 681 *et seq.*; *Hawkshaw* 596–605.

Facility for carrying out the modifications suggested by Messrs. Stephenson, Hawkshaw, &c.; these do not in the least affect the principle of construction, *App. p.* 87.

N.

Navigation of the River. Remarks by Mr. Page in a letter to Mr. Austin, dated 26 March 1856, upon the importance of considering the question of the navigation of the river in connexion with the stoppage of the works, *App. p.* 90. 101.——*See* also *Scour of the River.*

Novelty of Plan. Altogether the novelty of principle involved in the plan of the new bridge is such that witness is unable to sanction it, *Rendel* 218–225.

Report, 1856—*continued.*

O.

Old Bridge (*Westminster*).—Less safe condition of the old bridge than before the new works commenced, some of the foundations having been cut through, *Page* 149–152. 171——Possibility of keeping up the old bridge till the completion nearly of a new bridge, *Rendel* 279——Failure of the works undertaken by Mr. Walker for repairing the piers of the old bridge; probable cause of the subsidence, *Stephenson* 423–430. 684–688. 703–705.

Remarks by Mr. Page upon the danger to the old bridge if the stoppage of the works continue for any lengthened period, *App. p.* 90. 101.

See also *Removal of Old Bridge. Site.*

Old London Bridge. Reference by Mr. Page to the durability of the piers of Old London Bridge, *App. p.* 83.

P.

Page, Thomas. (Analysis of his Evidence.) Engineer for the Board of Works, as regards Westminster Bridge and the Chelsea Bridge and embankment, 9——On the transfer of the bridge to the control of the Board of Works by the Act of 1853, witness, as directed, prepared plans for its construction, 10–12——Difference, as regards the span of the arches and the width of the bridge, between the plans laid before the contractors and the plans approved by the Committee of the House of Commons, 13–16. 62–91. 101–110——The general plan in the specifications, as regards the foundation, was in principle the same as the plan explained to the Committee, 17–19. 109–111.

Approval subsequently by the Board of Works of the plan and specifications prepared by witness, 21–23. 92–94——Objection on the part of one of the firms which tendered for the contract to the use of wrought-iron piles and plates in the foundation; cast-iron piles and plates were subsequently decided upon, 26——Reference to sundry bridges in this country and in France, which differ mainly from the bridge planned by witness in their not being provided with timber bearing-piles, 27–34. 95. 113–132.

Plan of timber bearing-piles, backed up with concrete, and encased in iron piling, as the foundation for the bridge as planned by witness; advantages of such plan, 27. 95. 120–139——Reference to the construction by Mr. Brunel and Sir W. Cubitt of bridges with cylinders and concrete, as somewhat analogous to the construction advocated by witness, 27. 119–128.——Under the specification the piles were to be screwed into the ground, 35——According to the contract with Mr. Mare, 90 per cent. of the work executed was to be paid every six weeks, witness certifying as to the amount executed, 36–39. 49——Stipulation in regard to payment for extras, 40–43.

The work was commenced in July 1854, but, for some reasons, the contract was not signed till the October following, 44–47——Suspension of the works on 20th March last, at the wish of the assignees of Mr. Mare; the negotiations which led to this step are not officially known to witness, 48. 52–55. 59–61——Satisfaction generally of witness with the conduct of the work and the progress that was being made, save that in some respects such progress was not rapid enough, 50, 51. 56–58. 143–148——Greater difficulty than was anticipated in removing the buttresses and cutwaters of the old bridge, 50–57. 145–149. 153——Important work being done at the time of the stoppage, 57–149. 152. 171.

The general plan approved of by the Board of Works was not the same as the one laid before the Select Committee of the House, but was based upon it, and was but slightly different from it, 62–94——No plan of construction was submitted to or recommended by the Committee of the House, 84–92——Deviations, not material, made from the plan since the signing of the contract, 96–100——Explanation as to the piles having been driven instead of screwed, as laid down in the specification, 111, 112. 154–158. 162–170——The gradient of the roadway has not been affected by any deviation from the original plans, 140–142.

Progress made in regard to cutting away the old abutments; less secure state of the bridge in consequence, 149–151. 171——Allowance in addition to the contract for cutting away the old foundations, 159, 160——Willingness of Messrs. Cochrane, of Woodside Iron Works, to contract for the removal of the old bridge and the entire completion of the new bridge in two years from the time of its first opening, 161——Authority of the engineer to deviate from the specifications, 162, 163. 165–168——Whether the piles were screwed or driven, cofferdams would have been done away with, 168–170.

[Second Examination.]—Further statement as to the deviations from the specifications; belief that they are all improvements, 647–655, and *App. p.* 90, 91. 103——Terms of the contract in regard to deviations from the specifications, 656, 657——Sanction of the Treasury required as regards any changes of plan or large increase of expenditure, 657–659——The piles can without any difficulty be cut off at some feet below low-water; witness, however,

Report, 1856—*continued.*

Page, Thomas. (Analysis of his Evidence)—*continued.*

however, does not consider them, under the present arrangement, at all liable to decay, 660-662.

Insufficient time, as yet, for witness properly to draw up an answer to the report of Messrs. Rendel & Simpson, 663, 664——Witness considers that he has been injured in his being limited to call but two engineers to give evidence before the Committee, 664-666——Complaint also, more especially as regards the effect of the scour of the river, that facts have not been adduced by the Committee in reply to the opinions of Mr. Rendel, 664-673.

[Third Examination.]—Evidence to the effect that witness understood from Messrs. Rendel & Simpson that the principal reference to them was upon the contract, and that he had not at first any direct official intimation from the Office of Works that their inquiry was to extend to the plan and construction, 710, *et seq.*——Unsuccessful application made by witness on 19th May to the department of Works, for a copy of the instructions to Messrs. Rendel & Simpson, 713. 745-747. 769. 773-776.

Application subsequently by witness to Messrs. Rendel & Simpson for a copy of their instructions; extracts from the instructions were given him by Mr. Simpson, which extracts he contends were a private and confidential communication, 713-715. 737-781. 798——Examination to the effect that though Mr. Simpson stated that he and Mr. Rendel would have to inquire generally into the bridge, witness had not at first the least idea that their inquiries would go to the extent they did, 716-720. 726-737. 782-813——Reference to a suggestion by Mr. Rendel as to the importance of witness rather than the contractors superintending certain work, 716. 719.

Witness, in stating that he "had no information as to the object of Messrs. Rendel & Simpson's inquiry," meant to state that he "had no information from the department, 721-725——Up to the date of his application in May, he concluded that their inquiries principally related to matters connected with the contract, 726-729. 784-795. 802-813——Extent of inquiry by them into the construction, before their second instructions in March; the principle of the plan was not then called in question, 727. 784-795. 802.

[Fourth Examination.] Letter, dated 2d June 1856, from witness to Messrs. Rendel & Simpson, asking for extracts from their instructions, 861——Letter to Mr. Simpson, dated 16th June, as to witness being permitted to quote the instructions, *ib.*——Written statement, as modified, handed in by witness, 862, 863; and *App. p.* 77 *et seq.*

Page, Mr. Observations in detail by Mr. Page upon the several questions comprised in the report of Messrs. Rendel & Simpson; further defence and advocacy of the present plan, *App. p.* 77-90.

Circumstances, as brought forward by Mr. Page, under which the erection of the bridge was entrusted to him, *App. p.* 77, 78.

Permanence. See *Durability. Foundations. Piers.*

Piers. Plan of timber bearing-piles backed up with concrete, and encased in iron piling, as the foundation for the bridge; advantages of such plan, *Page* 27. 95. 120-139——Reference to sundry bridges in this country and in France, which differ mainly from the bridge planned by witness in their not being provided with timber bearing-piles, *Page* 27-34. 95. 113-132; and *App. p.* 83, 84. 91, 92.

Argument that to make the piers properly and unquestionably secure they must be built of solid masonry and carried deep into the London clay, *Rendel* 211, 212. 214, 215. 256, 257. 272-277. 282. 284. 295. 308. 317——Concurrence in Mr. Rendel's views, *Simpson* 278.

Objection to the use conjointly of granite slabs, of timber and iron piles, and concrete, as they may not all bear equally, and partial subsidence may result, *Stephenson* 321-324. 354-356. 372-380. 681. 690-693——The mixture of cast-iron and wrought-iron in a bridge is not necessarily a defect, *ib.* 436, 437.

Great durability of the piers; the internal works may be considered almost indestructible, *Hawkshaw* 457. 463-468. 564; *Fowler* 494-496. 505, 506. 540-542.

Though granite piers founded within cofferdams are most durable as piers, they are not expedient on account of the expense, *Hawkshaw* 469-471——The piers will be eighty-five feet long without the cutwaters, *ib.* 527.

Since his former examination witness has inspected the piers and the proposed superstructure, and has come to the conclusion that the work may, with some minor alterations, be safely proceeded with on the present design, *Stephenson* 674, 675. 689, 690——Decided advantage, however, if there had been fewer piers, and if cofferdams had been used, *ib.* 677. 680, 681. 706, 707.

Written statement by Mr. Page defending in detail the materials and mode of construction of the piers, &c., *App. p.* 80 *et seq.*

See also *Cofferdams. Concrete. Cylinders. Durability. Foundations. Iron Piles or Casing. Scour of the River. Strength. Timber Piles.*

Piles.

Report, 1856—*continued.*

Piles. See *Iron Piles, or Casing.* *Piers.* *Screw, or Driving Piles.* *Timber Piles.*

Plans. On the transfer of the bridge to the control of the Board of Works by the Act of 1853, witness, as directed, prepared plans for its construction, *Page* 10–12——Difference as regards the span of the central arch between the plans laid before the contractors and the plans approved by the Committee of the House of Commons in 1853; there was no other difference of any moment, *ib.* 13–16. 62–94. 101–110——Approval by the Board of Works of the plan and specifications prepared by witness, *ib.* 21–23. 92–94.

Construction of several bridges on principles analogous, though not exactly similar to the plan under consideration, *Page* 27–34. 95. 113–132, and *App. p.* 83, 84. 91, 92; *Hawkshaw* 591. 606, 607.

The plan approved of by the Board of Works was not the same as the one laid before the Select Committee of the House, but was based upon it, and was but slightly different from it, *Page* 62–94——No plan of construction was submitted to or recommended by the Committee of 1853, *ib.* 84–92——The gradients and the headway, and not the construction, were the main points inquired into by the Select Committee of 1853, *Fowler* 639–642. 646.

On the whole, witness sees no reason for not proceeding with the bridge as at present designed and commenced, *Hawkshaw* 487. 596–598; *Fowler* 488 *et seq.*——On due consideration and inspection, witness finds that the differences of opinion between Mr. Page and witness are of minor importance, and concludes that the bridge may safely be proceeded with on the present design, *Stephenson* 405, 406. 674 *et seq.*

Complaint as to witness being limited to call but two engineers to give evidence before the Committee in defence of his plan, *Page* 664–666.

See also *Cofferdams.* *Deviation from Plan.* *Foundations.* *Iron Piles, or Casing.* *Lateral Sections.* *Modification of Plan.* *Piers.* *Superstructure.*

Progress of Works. Satisfaction generally of witness with the conduct of the work, and the progress that was being made, save that in some respects such progress was not rapid enough, *Page* 50, 51. 56–58. 143–148, and *App. p.* 90——Concurrence in opinion as to the excellent manner in which the work has hitherto been executed, *Hawkshaw* 476–481; *Fowler* 510, 511. 622——Present condition of several of the piers; there is only one where the concrete is completed to the top, *Hawkshaw* 582–586——The works have been done in a very masterly way, *Stephenson* 675.

Remarks by Mr. Page upon the expediency of proceeding with the bridge without delay, *App. p.* 90. 101——Reference to the progress already made, and to the time in which the whole may be completed, *ib.* 90. 96.

Letters from Mr. Page to the Assistant Secretary of the Board of Works, in September 1855, with reference to the stoppage of the works on account of Mr. Mare's bankruptcy, and suggesting measures for their prosecution, *App. p.* 93, 94——Letter from Mr. Page to Mr. Austin, dated 12th January 1856, with reference more especially to the letting of the works to other contractors, and the importance of speedy progress in the execution of his plan, *ib.* 95.

See also *Assignees of Mr. Mare.* *Completion of Bridge.* *Suspension of Works.*

Prosecution of the Plan. See *Plans.* *Progress of Works.*

R.

Removal of Old Bridge. Greater difficulty than was anticipated in removing the buttresses and cutwaters of the old bridge, *Page* 50–57. 145–149. 153——Progress made with regard to cutting away the abutments; less secure state of the bridge in consequence, *ib.* 149–151. 171——Allowance in addition to the contract for cutting away the old foundations, *ib.* 159, 160.

It would be better to remove all the arches of the old bridge before beginning the new one, *Rendel* 281——Anticipated considerable difficulty in the removal of the bridge, *ib.*

Reference by Mr. Page to the different opinion given by Mr. Rendel in 1844, in regard to the removal, *App. p.* 86, 87——Grounds adduced by Mr. Page for concluding that the bridge may be removed with very great ease, *ib.* 87.

Offer of Messrs. Cochrane to remove the old bridge for 5,000*l.*, subsequently reduced to 2,500*l.*; the materials to become their property, *App. p.* 102.

Rendel, James Meadows, and Simpson, James. (Analysis of their Evidence) (*Mr. Rendel.*)—In consequence of previous communication with the Office of Works, Mr. Simpson and witness drew up a report, dated 28 June 1856, upon the scheme of construction of the bridge, 206–209——Grounds upon which they concluded that the mode of construction of the piers below water was defective, and rendered the foundations liable to subsidence,

Report, 1856—*continued.*

Rendel, James Meadows, and Simpson, James. (Analysis of their Evidence)—*continued.*

210 *et seq.*——Subsidence of Blackfriars Bridge, notwithstanding that it has bearing piles, 211. 213. 265, 266.

Great importance of providing against changes in the depth and bed of the Thames, and against the effect of an increased scour when the navigation is improved, 211–215. 225. 230–237. 239. 241–246, 292–294. 307——Argument that to make the piers properly and unquestionably secure they must be built of solid masonry, and carried deep into the London clay, 211, 212. 214, 215. 256, 257. 272–277. 282. 284. 295. 308. 317——Argument also that the piers should be founded within cofferdams; these moreover would be especially useful in removing the foundations of the old bridge, 211. 228, 229. 254–257, 272–276. 280–284. 304. 310–312.

Objection to a deposit of concrete outside the iron casing as a means of preventing the river from deepening its bed close to the piers, 211–215. 291–295. 303, 304——Inexpediency of depending upon concrete or other extra precautions, to be adopted from time to time, as a means of securing permanency, 213, 214. 292–295. 316, 317——Probability of partial settlement if the bridge be completed in halves, the second half to be built upon the site of the present bridge, 216–229——It would be much better to build two seperate bridges or lines of piers and to connect them at the roadway, 217. 222, 223. 226. 272.

Altogether, the novelty of principle involved in the new bridge is such that witness is unable to sanction it, 218–225——Under special circumstances only should either sheathing or bearing piles be driven or screwed into the London clay, 225. 238——Necessity of peculiar care in building upon the site of the present bridge, 227–229——(*Messrs. Rendel & Simpson.*) Considerable changes of late years in the bed of the river, more especially since the removal of Old London Bridge, and the greater extent of dredging, 230–232, 243–247——(*Mr. Rendel.*) Probability, if a Thames Embankment be formed and sundry obstructions to the flow of the river be removed, that all the gravel will be displaced and the original bed of clay arrived at by the increased scour, 233–237. 241–245. 307.

Advantage if the piles were cut off close to the London clay and then covered by a strong platform or grating of timber, upon which to found solid masonry, 239. 254, 255. 300–303. 308——Belief as to the impossibility, under the present scheme, of throwing the weight of the superstructure uniformly over the whole area of the pier, 239, 240. 295–310——It would be better if the iron piles did not act as bearing piles, as well as casing piles, 240——Construction and failure of Blackfriars Bridge adverted to; probable effect of the scour of the river, 248–253.

(*Mr. Simpson.*) Use of cofferdams in building the piers of Blackfriars Bridge, and in widening the piers of Westminster Bridge, 250. 253——(*Messrs. Rendel & Simpson.*) Anticipated tremulous motion of the piles, and consequent effect, 255, 256——(*Mr. Rendel.*) Inexpediency of depending upon divers for the fastening of the iron ties, and the jointing of the cast-iron plates, 257. 310——Want of analogy between the Blackwall wharf and the bridge, 258–262.

Recommended suspension of the works by Mr. Simpson and witness, irrespectively of the question of construction, 267–269——Immaterial effect as between the screwing and driving of the piles, 270——(*Mr. Simpson.*) Concurs generally in Mr. Rendel's evidence as to the defects of the proposed construction of the foundations, and as to the importance of founding in the London clay, 271–278.——(*Mr. Rendel.*) Expediency of a temporary bridge in carrying out the construction of a really permanent bridge, 272–276.

Possibility of keeping up the old bridge till the completion nearly of a new bridge, 279——Approval of the site being that of the old bridge, 280–284——The whole area to be disturbed should be enclosed within cofferdams, 280, 281——It would be better to remove all the arches of the old bridge before beginning the new one, 281——Anticipated difficulty in the removal of the old bridge, *ib.*——Approval generally of the superstructure proposed by Mr. Page, 283–285. 318——(*Messrs. Rendel & Simpson.*) Estimate that about 57,000*l.* worth of material would be available from the old bridge and new bridge, if the recommended alterations be adopted, 287, 288. 290——(*Mr. Simpson.*) Ample strength, generally, of the bridge, 289.

(*Mr. Rendel.*) Propriety of loading the piers so as to test their stability, 305, 306——Objection to founding the iron piles upon gravel, 309——Probable increase of time and expense if cofferdams be resorted to, 311——Course adopted by witness in order to preserve the foundations of the Lary Bridge, 313–315——Cofferdams are not necessary in the construction of all bridges, 319——Nor is it necessary always to dispense with concrete, 320.

[Second Examination.]—(*Mr. Simpson.*) Explains that cofferdams would be perfectly applicable in building a new bridge, but that, by their use, the building would occupy five years, 709.

[Third Examination.]—(*Mr. Rendel.*) With reference to the first communications between

Rendel, James Meadows, and Simpson, James. (Analysis of their Evidence)—*continued.*

between the Chief Commissioner and Mr. Simpson and witness, in January, it was understood by witness that inquiry was first to be made into the contract, and, on that question being determined, into the structural arrangements and plan, 814–821. 839–851——After the 16th January, Mr. Simpson and witness went over the works with Mr. Page, and made inquiries as to all the details of construction, 822–827. 835. 853. 855.

It never appeared to witness that his instructions were, as regarded Mr. Page, of a private nature, 828—— Communication by Mr. Simpson to Mr. Page of the main part of the instructions some time in May, 828–831. 844——(*Mr. Simpson.*) Though there was no order from the Office of Works in regard to the instructions being communicated to Mr. Page, witness did not consider that there was any secrecy in the matter, and on consultation with Mr. Rendel a copy was at once given, 832, 833. 861——General character of the first instructions, 834.

(*Mr. Rendel.*) Advice given by witness to Mr. Page on sundry questions of construction before the second instructions from the Office of Works, 835, 836. 853. 855. 857, 858——Explicit and direct instructions required by Mr. Simpson and witness before undertaking a more comprehensive inquiry than at first into the question of construction, 837, 838. 852. 860——(*Messrs. Rendel & Simpson.*) Probability of Mr. Page having become aware, or partly aware, of the extended nature of the inquiry before he was furnished with the instructions, 840–842. 846, 847.

(*Mr. Rendel.*) Further statement that there was no secrecy about the instructions, and that the communications generally with Mr. Page were conducted in a perfectly open way, 843–850. 853–859——Witness fully concluded that Mr. Page was entitled to see the instructions, and would not have hesitated about his having them, 847–849. 859——(*Mr. Simpson.*) How far the instructions were given to Mr. Page in confidence, 861.

Rendel, Mr. Comment by Mr. Page upon the contrast between the present opinions of Mr. Rendel and those expressed by him on former occasions, *App. p.* 86–88.

Roadway. The gradient of the roadway has not been affected by any deviation from the original plan, *Page* 140–142.

Rochester Bridge. Construction by Sir W. Cubitt of the bridge at Rochester upon principles analogous to those adopted by Mr. Page, *Hawkshaw* 591——Use of cast-iron and concrete, *App. p.* 84.

Rouen Bridge. Reference to the bridge at Rouen as a pile bridge, with concrete between and timber casing, cofferdams not having been used, *Page* 30–34. 116; and *App. p.* 92.

S.

Saumur Bridge. Construction seventy years ago of a bridge over the Loire at Saumur, upon principles generally similar to those advocated by witness, *Page* 31, 32—— Particulars as to the foundations, cofferdams not having been used, *App. p.* 91.

Scour of the River. Great importance of providing against changes in the depth and bed of the Thames, and against the effect of an increased scour when the navigation is improved, *Rendel* 211–215. 225. 230–237. 239. 241–246. 292–294. 307——Considerable changes of late years in the bed of the river, more especially since the removal of Old London Bridge and the greater extent of dredging, *Rendel & Simpson* 230–232. 243–247——Probability if a Thames Embankment be formed, and sundry obstructions to the flow of the river be removed, that all the gravel will be displaced, and the original bed of clay arrived at by the increased scour, *Rendel* 233–237. 241–245. 307—— Though it is proposed to dredge between the arches down to the London clay, witness still considers the concrete and the foundations would be endangered by an increased scour, *ib.* 246. 293, 294.

Effect of new piers and embankments along the river in increasing the scour, and in rendering additional precautions necessary in regard to the foundations, *Stephenson* 381–385. 407–410. 415–418——The increased scour is not likely to remove the whole of the gravel bed, *ib.* 383.

Impossibility of so great an increase to the scour of the river as injuriously to affect the foundations of the piers, *Hawkshaw & Fowler* 473, 474. 496–499. 561, 562. 623——The erection of any works which would cause a deep and irregular scour in any particular part of the river should not be allowed, *Hawkshaw* 474; *Fowler* 496. 561, 562——The permanence of the bridge would not at all be affected by the corrosion of the iron casing, inasmuch as, before the decay of the casing, the river will have assumed a permanent form, and there will be no scour that can injure the foundations, *Fowler* 489–499. 503–506. 539–542.

Report, 1856—*continued.*

Scour of the River—continued.

Complaint as regards the effect of the scour of the river, that facts have not been adduced by the Committee in reply to the opinions of Mr. Rendel, *Page* 664–673.

On further consideration as to the future increase of the scour of the river and its effect upon the foundations, witness adduces data for the conclusion that the foundations will not be endangered thereby, *Stephenson* 675, 677.

Sundry arguments adduced by Mr. Page in reply to the alleged danger to the foundations from an anticipated scour of the river, *App. p.* 84-86.

See also *Blackfriars Bridge. Dredging. Sectional Area. Thames Embankment.*

Screw, or Driving Piles. Under the specification, the piles were to be screwed into the ground, *Page* 35——Explanation as to the piles having been driven instead of screwed, as laid down in the specification, *ib.* 111, 112. 154–158. 162–170——Permission given by witness that the piles might be driven; his authority hereon, *ib.* 111. 162, 163. 165–170——Less expense by driving instead of screwing, *ib.* 111. 164——The advantage of screwing the piles was safety to the old bridge, *ib.* 156–158——Whether the piles were screwed or driven, cofferdams would have been done away with, *ib.* 168–170.

Immaterial effect as between the screwing and driving of the piles, *Rendel* 270—— Slight advantage if the piles were screwed instead of driven, *Stephenson* 438–441—— The substitution of driving piles for screw piles is immaterial, and cannot be considered an alteration of design, *Fowler* 628–631. 644.

Recommendation by witness to Mr. Page that the cast-iron piles should not be driven by contract, *Rendel* 835, 836. 855.

Sectional Area. Large sectional area of the bridge adverted to, as showing that there will be less tendency to scour than to deposit at that point of the river, *Fowler* 507–509.

Simpson, James (Analysis of his Evidence.) See *Rendel, James Meadows, &c.*

Site. Necessity of peculiar care in building upon the site of the present bridge, *Rendel* 227–229——The site of the old bridge is the best site for the new bridge, *ib.* 280. 284 ——But for the probable difficulties in regard to the site of the old bridge, the structure of Mr. Page would be of great durability; as it is, the foundations will be precarious, *Stephenson* 321. 402–404. 423–430. 440–446——On further consideration witness finds that the difficulties of the site are less than he had thought, *ib.* 682–688. 708.

See also *Lateral Sections. Removal of Old Bridge.*

Southwark Bridge. Provision made for the contraction and expansion of the iron, *Stephenson* 419. 431, 432.

Span of Arches. See *Arches.*

Stephenson, Robert (*Member of the House*). (Analysis of his Evidence.) — Adequate strength of the pier of the new bridge, as regards the direct weight of the superstructure, 321. 335–337. 401——Novelty of the application of cast-iron piles as a shell to the pier, 321——Certainty of the piles being broken if barges or ice were to strike against them, 321. 411–413——Provision against their being broken, inasmuch as they stop at six feet below low water, 321. 411. 414——Objection to cast-iron piles, as, when exposed to the action of water, not sufficiently durable or permanent, 321. 328. 350–353. 368–371. 401.

Objection also to the use conjointly of granite slabs, of timber, and iron piles and concrete, as they may not all bear equally, and partial subsidence may result, 321–324. 354–356. 372–380——But for the probable difficulties in regard to the site of the old bridge, the structure of Mr. Page would be of great durability, 321. 402–404—— Security for the durability of the timber piles, in their being driven to the level of low water, and thus constantly immersed; expediency of their being driven still lower, so as to guard against the lowest low-water that may yet be brought about by changes in the bed of the river, 322–327. 357–363.

Less permanence of iron piles than of granite masonry, 329–334——Equal difficulty in replacing iron piles as in replacing masonry, 330–333——Use of cast-iron piling in the wharf at Fleetwood and the Brunswick Wharf, 338–344——Inexpediency of booms as a protection to the piers, 345——There would practically be no great difficulty in regard to the lower plates reaching a solid bed in the clay, 346–349——The granite course should certainly commence at the lowest low-water mark, 358–363.

The piles may be driven through gravel into the London clay without any serious or injurious result, 364–367. 376–380——Security in founding upon Thames gravel, if kept in place by the piles, 364–367. 392, 393——The wrought-iron ties to the granite slabs would, to a great extent, be exempt from oxidization, 370, 371. 394–400——Effect of new piers and embankments along the river in increasing the scour, and in rendering additional precautions necessary in regard to the foundations, 381–385. 407–410. 415–418 ——The London clay, when once reached in the borings of the bridge, extends to a considerable depth, 386–389.

Objection

Report, 1856—*continued.*

Stephenson, Robert (*Member of the House*). (Analysis of his Evidence)—*continued.*

Objection to the use of cylinders in piling for the foundation, 390, 391——Very precarious and unsafe character of the foundations of the old bridge adverted to as a strong argument against building a portion of the new bridge upon the same site, after the completion of the other portion, 402–404. 423–430. 442–446——Opinion that it would have been much better if, from the first, cofferdams had been used; they may, in fact, still be necessary, 402. 417. 447, 448——Further consideration required by witness before giving an opinion as to the expediency of sacrificing the money already expended, and beginning a new bridge on a different plan, 405, 406.

Adequacy in the main of a protection of the piers by a deposit of concrete after dredging between the arches, 409, 410——Had the design rested with witness, he would have laid the foundations deeper and more permanent, 416–418——Alteration necessary as regards the cast-iron arches being fitted together accurately as one mass; there must be some provision, which would not be expensive, for expansion and contraction, 418–422. 431–435——Failure of the works undertaken by Mr. Walker for repairing the piers of the old bridge; probable cause, 423–430——The mixture of cast-iron and wrought-iron in a bridge is not necessarily a defect, 436, 437——Slight advantage if the piles were screwed instead of driven, 438–441——If the bridge be built in independent lateral sections, it would be better to have separate piers, the connexion being only at the roadway, 441–446.

[Second Examination.]—Since his former examination, has inspected the piers and the proposed superstructure, and has come to the conclusion that the work may, with some minor alterations, be safely proceeded with on the present design, 674, 675. 689, 690——The works have been done in a very masterly way, 675——The differences of opinion between Mr. Page and witness are in effect of minor importance, *ib.*

On further consideration as to any future increase in the scour of the river, and its effect upon the foundations, witness produces data for the conclusion that the foundations will not be endangered thereby, 675–677——Decided advantage if there had been fewer piers, and if cofferdams had been used, 677. 680, 681. 706, 707——Impracticability, however, of cofferdams in the present case, on account of the spans of the arches being limited to 120 feet, 677, 678——Adequacy, moreover, of divers as a means of seeing to the security of the work, 679, 680.

Further reference to the importance of having the piers homogeneous, 681. 690–693——Ample sufficiency, however, of the piers, independently of the granite or the iron casing, to bear the weight of the superstructure, 681, 682——Modification suggested in regard to the granite plinth, so as to avoid inequality of pressure, 681. 702——It would be much better if the iron piles were not also bearing piles, 681. 690, 691.

On further consideration witness finds that there would be less difficulty than he before stated in building upon the site of the old piers, and that, in fact, the new bridge may with safety and without partial settlement be built in halves, 682–688. 708——Cause of the subsidence of the old bridge further adverted to, 684–688. 703–705.

Provision can, without altering the design, be made for the expansion and contraction of the iron superstructure, 688, 689——The concrete is peculiarly good, and there is no chance of its decaying, 689——The greatest inconvenience which can arise under the modifications suggested by witness, and mainly accepted by Mr. Page, is that the iron piles may in some fifty or one hundred years require replacing, which can readily be done, 693–698——It is essential that the timber piles be kept positively below low water, 698, 699——Circumstance of the Hungerford Bridge piers being built on gravel, protected by sheet piling; approval thereof, 700, 701.

Stoppage of Works. See *Suspension of Works.*

Strength. Belief as to the impossibility under the present scheme of throwing the weight of the superstructure uniformly over the whole area of the pier, *Rendel* 239, 240. 295–310——Propriety of loading the piers so as to test their stability, *ib.* 305, 306——Ample strength generally of the bridge to resist weight, *Simpson* 289.

Adequate strength of the piers as regards the direct weight of the superstructure, *Stephenson* 321. 335–337. 401; *Hawkshaw* 454–456. 472. 563–567——Adequacy of the timber piles or of the concrete to sustain the weight of the superstructure; any unequal pressure would not therefore be practically of any consequence, *Fowler* 500–502——Ample sufficiency of the piers, independently of the granite or the iron casing, to bear the weight of the superstructure, *Stephenson* 681, 682.

See also *Durability.*

Superintendence. Recommendation by Mr. Rendel, that the works up to two feet above low water should be directly and entirely superintended by witness, *Page* 716. 719——Reason for the foregoing recommendation, *Rendel* 835, 836. 853. 855. 857.

Report, 1856—*continued.*

Superstructure. Variation, since the signing of the contract, in the cast-iron ribs of the roadway, *Page* 98——Approval generally of the superstructure proposed by Mr. Page, *Rendel* 283-285. 318——Objection to mixing cast-iron and wrought-iron in the same bridge, *ib.* 318——Alterations necessary as regards the cast-iron arches being fitted together accurately as one mass; there must be some provision, which would not be expensive, and can easily be made, for expansion and contraction, *Stephenson* 418-422. 431-435. 688, 689.

Explanation by Mr. Page as to the provision for adequate strength, and for the expansion of the iron, *App. p.* 88.

See also *Arches. Durability. Strength.*

Suspension of Works. Suspension of the works on 20th March last, at the wish of the assignees of Mr. Mare; the negociations which led to this step are not officially known to witness, *Page* 48. 52-55. 59-61——Important work being done at the time of the stoppage, *ib.* 57. 149-152. 171.

Negotiations between the assignees of Mr. Mare and the Board of Works, which led to the stoppage of the works, *Austin* 172 *et seq.*——The first application for the suspension of the works emanated from the the assignees, *ib.* 175. 179-182.

Recommended suspension of the works by Mr. Simpson and witness, irrespectively of the question of construction, *Rendel* 267-269.

Circumstances, as adduced by Mr. Page, in connexion with the suspension, *App. p.* 79 *et seq.*——Letter from Mr. Page to Mr. Austin, dated 19th March 1856, with reference to an arrangement between Sir Benjamin Hall and the assignees of Mr. Mare for the discontinuance of the work, and commenting on the omission to give notice thereof to the engineer, *ib.* 99, 100——Reply to the foregoing by Mr. Austin, dated 22d March 1856, *ib.* 100.

Further letter from Mr. Page to Mr. Austin, dated 26th March 1856, on the subject of the discontinuance of the works, and the necessity of providing against certain contingencies consequent thereon, *App. p.* 100, 101.

See also *Assignees of Mr. Mare. Navigation of the River. Progress of the Works.*

T.

Temporary Bridge. Expediency of a temporary bridge in carrying out the construction of a really permanent bridge, *Rendel* 272-276.

Grounds adduced by Mr. Page for the avoidance of a temporary bridge; opinion to a similar effect expressed by Mr. Rendel in 1851, *App. p.* 87, 88.

Thames, The. See *Scour of the River.*

Thames Embankment. The Embankment of the Thames, though it might deepen the bed of the river generally and equally, would not affect the foundations, *Fowler* 498, 499. 562. 623.——*See* also *Scour of the River.*

Timber Piles. Advantage if the piles were cut off close to the London clay, and then covered by a strong platform or grating of timber on which to found solid masonry, *Rendel* 239. 254, 255. 300-303. 308——Security for the durability of the timber piles in their being driven to the level of low water, and thus constantly immersed; expediency of their being driven still lower, so as to guard against the lowest low water that may yet be brought about by changes in the bed of the river, *Stephenson* 322-327. 357-363——Timber piles constantly immersed last for an immense period, *Hawkshaw* 564——It is essential that the timber piles be kept positively below low water, *Stephenson* 698, 699.

The piles can without any difficulty be cut off at some feet below low-water mark; witness, however, does not consider them, under the present arrangement, at all liable to decay, *Page* 660-662. and *App. p.* 87.

See also *Cofferdams. Concrete. Durability. Foundations. Granite Plinth Course. Piers. Screw or Driving Piles.*

Treasury, The. Sanction of the Treasury required as regards any changes of plan, or large increase of expenditure, *Page* 657-659.

V.

Valuation of Works. Report of Mr. Charles Stephenson, dated 14th June 1856, valuing the permanent works, materials and plant at 85,009 *l.* 1 *s.*, *Austin* 187-189.

Letter from Mr. Austin to Mr. Charles Stephenson, dated 18th March 1856, with reference to a valuation of the works already executed, *App. p.* 99.

Report, 1856—*continued.*

W.

Weight of Superstructure. See *Strength.*

Width. Deviation, as regards the width of the bridge from the plan laid before the House of Commons, *Page* 15, 16—— Statement by Mr. Page in support of the contemplated width, *App. p.* 88, 89.

Windsor Bridges. Use of cast-iron piles, bearing piles and concrete, in two bridges planned by witness at Windsor, *App. p.* 27, and *App. p.* 84.

Workmen. Remarks by Mr. Page upon the inconvenience likely to arise from the dispersion of the staff and workmen, *App. p.* 94. 101.

Wrought-iron Ties. The wrought-iron ties to the granite slabs would, to a great extent, be exempt from oxidization, *Stephenson* 370, 371. 394-400.

REPORT

FROM THE

SELECT COMMITTEE

ON

ORDNANCE SURVEY OF SCOTLAND;

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

APPENDIX, AND INDEX.

Ordered, by The House of Commons, *to be Printed,*
6 *May* 1856.

198.

Lunæ, 3° *die Martii*, 1856.

Ordered, That a Select Committee be appointed to consider the Ordnance Survey of Scotland.

Lunæ, 31° *die Martii*, 1856.

Committee nominated of,—

Viscount Duncan.	Mr. Baxter.
The Lord Advocate.	Mr. Dunlop.
Mr. Evelyn Denison.	Mr. Edward Ellice.
Mr. Stephenson.	Mr. William Lockhart.
Mr. Lloyd Davies.	Mr. Smollett.
Lord Elcho.	Mr. Leicester Vernon.
Mr. Stirling.	Marquis of Stafford.
Mr. Laffan.	

Ordered, That the Committee have power to send for Persons, Papers, and Records.

Ordered, That Five be the Quorum of the Committee.

Martis, 6° *die Maii*, 1856.

Ordered, That the Committee have power to Report their Observations, together with the Minutes of Evidence taken before them, to The House.

REPORT - - - - - - - - - - - - - p. iii

PROCEEDINGS OF THE COMMITTEE - - - - - - - p. xi

MINUTES OF EVIDENCE - - - - - - - - - - p. 1

APPENDIX - - - - - - - - - - - - - p. 115

INDEX - - - - - - - - - - - - - - p. 127

REPORT.

THE SELECT COMMITTEE appointed to consider the ORDNANCE SURVEY of *Scotland*, and who were empowered to Report their OBSERVATIONS, together with the MINUTES OF EVIDENCE taken before them;—— HAVE examined the Matters to them referred, and have agreed to the following REPORT:—

YOUR Committee report to the House that they have been much assisted in the course of the present Inquiry on the Ordnance Survey of Scotland by the large and valuable body of evidence collected by the Treasury during the time when Lord Elcho was in office, and presented in 1853 and 1854 to both Houses of Parliament by command of Her Majesty. That evidence has been collected in the shape of replies to Treasury Circulars, and it contains the written opinions dispassionately given of a large body of the most eminent, scientific, and professional persons in the Kingdom, and indeed of almost all those who are most qualified by their experience and attainments to speak with authority on the important subject of a National Survey. Your Committee have also received great assistance from the important witnesses who have been examined. The value of such evidence can only be duly appreciated by a perusal of it. Your Committee felt that it was their duty to sit *de die in diem*, and thus avoid unnecessarily occupying the time of the officers at present actively engaged in the Government departments and in the Ordnance Survey by a protracted investigation.

It appears from the evidence taken before this Committee, that when the Ordnance Survey was first undertaken in 1784, it was merely intended to produce a military map of the southern counties of the Kingdom, but that as the work advanced it came into general favour as a road map, a travelling map, a county map, and general geographical map; that so it continued till 1824, when Lord Monteagle and the Irish Members of Parliament came to the conclusion that it would be advisable, in the adaptation of the national survey to Ireland, to secure some further social advantages, and especially to make it subservient to the proper assessment and collection of the grand jury cess and other local taxes in that part of the kingdom; that a Committee of the House of Commons sat in 1824, of which Lord Monteagle was Chairman, which recommended a townland survey of Ireland, on a scale of six inches to a mile; that a six-inch scale was accordingly adopted; and that when a portion of Ireland had been completed, the Government was further induced to extend the details of the survey from the boundaries of townlands to the subdivisions of fields. Q. 2.

In 1840, all England, with the exception of the six northern counties, had been surveyed on the scale of two inches, and published and engraved on the scale of one inch to a mile; and a small portion of Scotland had been previously surveyed on a similar scale.

When the survey came to the six northern counties, it was found that those thickly peopled manufacturing, mining, and colliery districts could not be properly represented on the one-inch scale; representations as to the utter impossibility of mapping those districts on that scale, even so that they Q. 2.

might be easily distinguished by a magnifying glass, were made by geological and various scientific and other societies and individuals; and the Treasury, acting in accordance with the advice of the Duke of Wellington, recorded a Minute, dated 1st October 1840, in which, after a full explanation of the subject, it was stated that "My Lords being of opinion, that if the nation incurs the cost of a "survey, that survey ought to be of a kind most generally useful, they have no "hesitation in giving their consent to the remainder of England and the whole "of Scotland being surveyed on the Irish scale of six inches to a mile."

Blue Book on the Ordnance Survey, 1854, p. 15.

Papers on the Ordnance Survey, page 11.

Your Committee find that the Survey of Scotland was suspended in 1828, in order that the survey of Ireland might be proceeded with; that previously to that suspension, the county of Wigton, and one-half of the counties of Ayrshire and Kirkcudbright, had been surveyed and drawn for the one-inch scale; and that on the completion of the survey of Ireland in 1840, the Survey of Scotland was resumed on the six-inch scale, which had been found of such great value in the Survey of Ireland. Thus the work which had been previously done on the one-inch scale, was unfortunately thrown away; and the distinction between the peculiar advantages of a six-inch survey, as applicable to the townlands of Ireland in comparison with the larger territorial divisions of Great Britain, which is fully explained in the evidence appended to this Report, was not at that time sufficiently taken into consideration. Your Committee find that the survey was proceeded with in the three counties of Wigton, Kirkcudbright, and Edinburgh, which were accordingly mapped and engraved by the Ordnance on the six-inch scale.

Q. 284.

In 1849, the subject of the Ordnance Survey of Scotland was brought under the notice of the Select Committee on Ordnance and Army Expenditure, of which Lord Seymour was Chairman; that Committee had before them the entire estimate of the Survey of Scotland, but the only recommendation they made was, that the survey of the towns should take precedence of the survey of the rural districts; which recommendation was complied with.

The next step of importance was Lord Elcho's Committee on the Scotch Survey, which sat in 1851. The state of the case as regards Scotland then was, that a six-inch map had been resolved upon, but no one-inch map. The question before the Committee was simply whether they would have a six-inch map or a one-inch map. An alternative between those two maps was the only question proposed to them, and they pronounced in favour of the inch map, on the ground that it was better adapted to geographical purposes, and that the six-inch map alone was not of sufficient public utility to justify the large expenditure of public money that was required. The Committee also appears to have acted under a general impression, that by dispensing with the six-inch scale, the one-inch scale would be more speedily proceeded with.

Q. 5.

Orders were given by the Treasury and Ordnance in conformity with the Report of that Committee. Lancashire, Yorkshire, Kirkcudbrightshire, and Edinburghshire being nearly finished, were ordered to be completed on the six-inch scale; and the remaining four counties of England and the rest of Scotland were to be done on the one-inch scale.

Q. 17.

These instructions produced the greatest dissatisfaction in Scotland and in the unsurveyed portion of England.

Q. 22.

Consequently, in 1852 and 1853, numerous representations were received from Commissioners of Supply, Royal Burghs, and various bodies in Scotland, and from the magistrates and others connected with the colliery and mining interests in the north of England, the object of which was to induce the Treasury to rescind the orders which had been given in accordance with the recommendation of the Committee of 1851 in favour of the six-inch scale. Some of these memorials were referred to the Board of Ordnance by the Treasury in June 1852; and a determination was come to by those Departments that the survey of Fife, which was at that time going on, should be conducted on the six-inch scale, and that the question of the scale as to the rest of the country should be reserved for future consideration. Meanwhile the desirableness of an increased scale was much discussed by professional persons, and a more mature knowledge of the subject was arrived at.

Q. 22.

Q. 20.

Q. 26.

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In February 1853, Lord Elcho, who was then a Lord of the Treasury, drew up a very able memorandum on the survey, which, with numerous letters on the subject, was transmitted, with the Treasury circular letter of the 16th April 1853, to a large number of the most experienced and scientific societies and persons in the kingdom, requesting them to state their opinion on the comparative merits of a six-inch as contrasted against any larger scale, for the purposes of a national survey; it being understood that the inch scale would under any circumstances be proceeded with. The replies were as follow:—In favour of the scale of six inches, 32; in favour of a larger scale, 120: amongst whom were the Registrar-General; the President of the Geographical Society, Sir Henry De la Beche; Mr. A. C. Ramsay, Director of the Geological Society; the President of the Geological Society; the Society for the Amendment of the Law; the Metropolitan Commissioners of Sewers; the Ecclesiastical Society; the Poor Law Board; the Board of Supervision for Relief of the Poor; the Commissioners of Woods; the General Board of Health; the Statistical Society; the Statistical Conference, &c. &c. The weight of authority being thus decidedly in favour of a larger scale, a second circular was, on the 16th of January 1854, addressed to the same parties, requesting them to state what scale they would recommend.

Blue Book, p. 19.

Page 53.

Page 225.

These replies were, by a Treasury Minute, dated June 13, 1854, submitted to a Committee consisting of Sir John Burgoyne, Mr. Blamire, and Mr. Rendel, with instructions to report the result of the answers to the Treasury Circular of 1853.

Page 343.

Sir John Burgoyne, Mr. Rendel, and Mr. Blamire unanimously reported that the weight of the evidence in the printed correspondence before them was decidedly in favour of the scale of one two-thousand-five-hundredth part of the linear measure of the ground to be mapped (popularly termed the 25-inch or one square inch to one acre scale).

Page 343.

Under these circumstances, the Treasury determined, by a Minute, dated July 15th, 1854, "That the surveys of Ayrshire and Dumfries-shire should be "laid down and drawn on paper on the scale recommended by the Committee, "*i. e.* of one two-thousand-five-hundredths of the linear measurement of the "ground; also, that until a final determination should be arrived at as to the "scale upon which the Ordnance Survey should be conducted and engraved, "the course which has been authorised in reference to Ayrshire and Dumfries-"shire should be applied to other districts."

Page 344.

Your Committee find that Colonel James, the present superintendent of the survey, to whose ability and proficiency testimony has been borne by Sir Roderick Murchison, Sir C. Trevelyan, Sir John Burgoyne, Mr. Stevenson, Colonel Dawson, and other witnesses. was first employed as a director of the Ordnance Survey in 1854.

Q. 633.

Ordnance Survey, 1855, p. 1.

On the 18th of May 1855 the Treasury recorded a Minute, founded on a Report and Memorandum submitted to them by Colonel James, in relation to the engraving of the Ordnance Survey of Scotland, which required immediate steps to be taken, in which their Lordships stated that they have arrived at the following conclusions:

1. That it is unnecessary to have plans of the Highlands and uncultivated districts on the scale of one thousand two-five-hundredths, and that the superintendent of the survey should exercise his discretion as to the districts, the plans of which are to be made on that scale.

2. That plans on the one two-thousand-five-hundredths scale should not be engraved, but that copies, when wanted, should be made by the anastatic process.

3. That the Highland and other partially cultivated and thinly peopled districts should be drawn on the scale of six inches to a mile, and copies, when wanted, should be furnished by the anastatic process.

4. That the general map of Scotland on the scale of one inch to a mile should be proceeded with as rapidly as possible.

5. That the plans of towns containing more than 4,000 inhabitants should be drawn on the scale of one five-hundredths linear measurement.

Appendix. And on the 1st August 1855, Lord Panmure (who sat on the Committee of 1851 as Mr. Fox Maule) addressed a letter to the Treasury, in which he states his opinion that however necessary it may be to delineate a portion of the country on the 25-inch scale, such an enlarged map should not supersede the production of a map from the same survey on the scale of six inches to one mile for the same districts uniformly with those parts of the country which are laid down on the last-mentioned scale only.

Q. 7. It will be found, from the evidence of Sir Charles Trevelyan, that the only question raised before the Committee in 1851, was between the comparative advantage of a six-inch map and a one-inch map; and that the more important question as to whether a national survey undertaken on a scale sufficiently large for general and national purposes should be adopted, does not appear to have been taken into consideration by that Committee, nor is any reference made to that part of the subject in their Report.

Your Committee find that since the Ordnance Survey has been undertaken,
Q. 8. and general attention has been more immediately directed to its object,
there has been a gradual progress of public opinion in favour of conducting
Q. 586. it on the larger scale of 25 inches to a mile, equal to one inch to an acre. This has been most ably explained by Sir Roderick Murchison, Sir John Burgoyne, and Sir C. Trevelyan, who all concur in stating that the further the
Q. 616. larger survey has proceeded the more they have become prepossessed in its favour. It is likewise worthy of observation that at Aldershot, Portsmouth,
Q. 622. and in several places in the south of England previously surveyed on the one-inch scale, a re-survey on a scale of 25 inches to the mile has been found essential for military purposes.

Your Committee find that the idea of a cadastral survey of 25-inches
Q. 729. originated with Delambre and Laplace in 1793. A commission, of which they were members, recommended it to Napoleon in 1807, who adopted
Q. 281. it, and carried out the survey of France upon that scale with signal success. It appears, from a Paper laid before the Committee, that the proposal to adopt the 25-inch scale in Great Britain originated with Colonel Dawson, attached to the Tithe and Inclosure Commission, who stated that had his suggestions been adopted in 1837, when the one-inch Ordnance maps were
Q. 284. found utterly inapplicable to and useless for the purposes of the Tithe Commission, an expense of 3,529,830*l.* might have been saved to the country,
Q. 271. besides a further considerable outlay in respect of surveys for roads, canals, water supply, and the sale and transfer of property, which he has no means of
Appendix. estimating.

Very valuable evidence has been given by the Lord Advocate of Scotland as to the effect of the adoption of a survey on the 25-inch scale, on mortgages and transfers of landed property. It will be found that the Lord Advocate confined his evidence to the facilities that would be afforded to this important
Q. 626. class of transactions by correct maps of property, published and circulated under the authority of the Government; that he stated that, in his opinion, the depositing of such maps might be available to supersede descriptions of property; that the system of registration of deeds now in force in Scotland affords peculiar
Q. 642. facilities for such a system; and in his own words, that "he is perfectly satisfied "that in 10 or 20 years, although conveyancers would, in all probability, keep "up descriptions, as lawyers do, for greater safety, yet he thinks that that "system might be gradually dispensed with." Such an opinion, coming from so high a professional source, is well worthy of consideration.

Your Committee would next advert, in confirmation of the advantages pointed out by the Lord Advocate, to the evidence of that distinguished engineer, Mr. Vignolles, who stated that in Bavaria, where he has been extensively employed
Q. 840. in surveying, all transfers of land are made by cadastral maps, on a 25-inch scale;
Q. 843. that no practical difficulties occur in the use of these maps, and that he does
Q. 851. not believe that there would be any difficulty in applying a similar system to
Q. 857. Great Britain; that it would be necessary to re-register property transferred in this manner, when it was subdivided and sold in separate lots, but that in Scotland, where every conveyance and transfer of property is registered, every difficulty would be obviated by employing the same officers who are employed in registering

registering deeds, to register the plans also ; that the greatest advantages have been practically derived by him, as a civil engineer, from maps similar to those proposed to be made from the Ordnance Survey of Scotland, specimens of which were hung up in the committee-room, and which are similar to those in general use in Bavaria, Baden Baden, and Switzerland. Q. 853.

Your Committee examined most carefully into the estimates and probable cost of the survey, as proposed by Colonel James; and found that after a year and a half's experience, his original estimates are fully borne out and confirmed in practice, and that a sum of 917,000 *l.*, of which 284,000 *l.* has been already expended, will cover every expense attendant on the 25-inch cadastral survey of Scotland, including the publication of maps on the reduced six-inch and one-inch scales, and the maps of the towns on 10 feet to the inch scale. Q. 356.

That for the six-inch survey alone, 817,000 *l.* would be required, including the publication of the maps, and for the one-inch survey alone 250,000 *l.*, including the publication of the maps. That the difference of the cost of surveying between the 25-inch and 6-inch surveys would be comparatively immaterial, and that the recent introduction of the anastatic and photographic processes, the substitution of piece-work for day-labour, and many other improvements detailed in the evidence, will lead to increased economy in producing reduced maps from an enlarged survey. Q. 40. Q. 367. 379. Q. 391.

It also appears that 76,000 *l.* has already been paid back into the Treasury for maps sold, and that the Treasury are now realising 4,000 *l.* annually from the sale of Ordnance maps; that one year more will pay off the cost of engraving Ireland, and that a few years more will repay the cost of engraving Scotland; and that the superintendent of the survey finds, from experience, that as regards the 25-inch maps, 33 copies taken by the anastatic or zincographic process will repay the entire cost of production, and that he feels quite confident that if his suggestions with regard to the publication of the 25-inch scale map are followed, the entire cost of the publication will be eventually repaid at no distant period. Q. 391.

Of the 917,000 *l.*, deducting 284,000 *l.* already expended, there remains a sum of about 633,000 *l.* required to complete the survey of Scotland in the manner proposed. That sum of 633,000 *l.* would be spread over 10 years, thus making an annual vote required to complete the survey of Scotland, on the most approved principles, of 63,000 *l.* a year. Q. 435. Q. 438.

In Ireland a six-inch map and a one-inch map will have been obtained at an expense of 1,293,014 *l.*

In England and Wales a one-inch map has been obtained, exclusive of the six northern counties, at an expense of 989,219 *l.*

England and Wales together are estimated to contain about 60,000 square miles, Scotland about 30,000 square miles, and Ireland about 30,000 square miles. Q. 510.

The survey of Scotland, conducted and completed in the manner recommended by Colonel James, can therefore be produced for about 300,000 *l.* less than the survey of Ireland has cost.

Your Committee concur in the opinion expressed by Sir John Burgoyne, Sir C. Trevelyan, Mr. Stephenson, Colonel James, Mr. Sopwith, &c., that the question before the Committee is not one which is to be considered solely on a financial basis. Whatever the first outlay may be, it may hereafter be found, as has proved to be the case in France, that it is more economical in the first place to produce a large cadastral map, from which other maps on smaller scales can be reduced at a trifling expense, than to re-survey the ground, as has been the case both in England and Scotland, owing to the insufficiency of the parent survey. Q. 517. Q. 732. Q. 869. Q. 47. Q. 47.

Your Committee would next advert to the delay in executing the Ordnance Survey, which has been justly complained of by many of the witnesses examined. It appears that this delay, which extended to about 20 years, has been partly caused by the transfer of the whole of the Ordnance surveying staff to Ireland

in 1827, a circumstance which, as it has been proved by the evidence to have been attended with vast advantage to Ireland, Your Committee cannot for a moment regret. They find, however, that there have been other delays, occasioned by the want of a definite idea of what sort of a survey is required, which have been productive of much unnecessary labour, confusion, and expense.

The time has now arrived when it is absolutely necessary for Parliament to consider, and finally determine, the comprehensive question, What is the nature of the survey which they are prepared to sanction as the one which will most conduce to the general interest of the nation at large.

Your Committee have come to a decision in favour of the $\frac{1}{2500}$ scale for a cadastral survey of the country. In doing so, they are influenced by the great advantages which may be anticipated from the prosecution and completion of such a national work on principles which have been already successfully acted upon in the surveys of France, Bavaria, Switzerland, and other countries in Europe.

Of the purposes which a national survey ought to subserve, some of the principal appear to be—

1. The registration of titles.
2. The simplifying and cheapening conveyances of land, deeds of sale, leases, and all transfers of landed property.
3. Local valuation and assessments.
4. Adjustment of civil and ecclesiastical divisions.
5. Inclosure of waste lands.
6. Sanitary purposes.
7. Statistics.
8. Parliamentary purposes, in reference to Standing Orders.
9. Geological and mineral surveys.
10. General drainage, water supply, and engineering purposes.
11. Military and purely scientific purposes.

To secure such advantages as these, it is essential that a national survey should be conducted on a scale which, at the same time that it is susceptible of reduction for geographical uses, is also large enough to be available for general purposes of utility to all classes of the nation.

It will be found from the evidence that the partial prosecution of the survey on a large scale has already produced the most important scientific and practical results.

It has been proved that, unless the survey be conducted on a scale large enough to admit readily of the insertion of all the names and places in the populous mining and manufacturing districts, the attainment even of a correct geographical map is always difficult, and in many cases entirely impracticable. It has also been established that areas cannot be accurately measured from the paper (which is the real test of the practical usefulness of a cadastral survey) on a scale of less than 24 inches.

The Committee would next advert to the fact that, while it is possible to reduce, it is impossible to enlarge a parent map. A survey conducted on a small scale is liable to error; and the error, however small, if magnified even by the stretching of paper or other accidental causes, may be and has been productive of serious consequences; they have therefore recommended the completion of the Ordnance Survey of Scotland on such a scale and in such a manner as will secure the greatest accuracy and uniformity on the one hand, and make the most of the work that has been already done and engraved on the other.

Thirteen counties in Scotland have been already surveyed. Those comprehend, with the exception of Lanarkshire, Perthshire, Aberdeenshire, Forfarshire, and a few of the north-eastern counties, by far the most important of the populous and cultivated districts, to which alone the survey on the 25-inch scale is

is to be limited. It is admitted that, under any circumstances, a map of the Highlands, published on a one-inch scale, must be produced.

On examining the estimates it will be found that the plan recommended by the Committee, which will be completed for 633,000 *l.*, includes an estimate for a publication of the Ordnance Survey on both the six-inch and one-inch reduced from the 25-inch scale. Now, the production of a one-inch Ordnance map of the whole country as speedily as possible is an essential part of the plan. It is admitted, that for the sake of accuracy, the survey for a map on a one-inch scale must be conducted on a larger than a one-inch scale; and as no unnecessary delay can occur by adopting the six-inch as the intermediate scale for the production of the one-inch map, Your Committee recommend that it should be proceeded with. The plans on the 25-inch scale, though admirably adapted for the purposes above-mentioned, are too large for use out of doors. Contoured maps for engineering, geological, and several other purposes, on a uniform and intermediate scale between the 25-inch and the one-inch are required. Such maps can be sold at a price which will cover the entire cost of making them, and they will be found of great value as maps of reference for many public as well as local and private purposes. Your Committee think, besides, that it would not be real economy to incur the expense of a national survey, without, by the publication of such maps, deriving the utmost advantage from it. The completion of the publication of the six-inch maps is necessary to render the survey uniform in both the Highland and Lowland districts.

Appendix, No. 2, p. 118.

Even for those who may doubt whether, in the first instance, a survey founded on the cadastral 25-inch and intermediate six-inch scale is the very best that could have been adopted for Scotland, yet, adverting to the fact that five counties have been already surveyed on the 25-inch scale, that eight counties are actually engraved on the six-inch scale, and that more are in progress, it is a matter for consideration whether, under these circumstances, it may not be wise to execute at the further outlay of 633,000*l.* in 10 years, a survey of Scotland on principles on which similar national works have been performed with success in other countries in Europe, and which will be available for the general purposes above enumerated.

Q. 887.

Your Committee have had under their consideration the several methods which have been recommended or adopted for ascertaining and recording levels, viz., by levelling the sides of each triangle, as was first done in Ireland, by which method the heights of definite points on the summits of the hills, and the height at which every line crosses the roads or streams is given, or by means of contours at given altitudes, following all the sinuosities of the ground, and "bench marks" on fixed objects on the main roads, and other permanent surfaces.

This subject has been under the consideration of other Committees of the House of Commons, and of a Special Commission composed of distinguished scientific gentlemen.

The Committee of 1853, on the Map of Ireland, in their Report, say, that "in order to render the general map of Ireland, reduced to the scale of one "inch to a mile, as extensively useful as possible both to the public and to "scientific men, and at the same time worthy of the great survey upon which "it is based, the delineation of the hills and vallies should be grounded upon "contour lines ascertained from actual survey, and they consider it highly "desirable that such a number of those lines as may be found suitable to the "scale on which the map is based, should be actually exhibited thereon."

Parliamentary Paper, 921, Sess. 1853.

The Commission of 1854, of which the Earl of Ellesmere was Chairman, had under their special consideration "the advantage of applying a system of "contouring to the Ordnance maps;" and they recommended "that levels "should be taken on certain principal lines, and at defined prominent points." "That these levels would be more practically useful when given upon roads, "railways, and canals, or bridges, milestones, churches, &c. That contour lines "to a certain extent would be a useful addition to a map on the six-inch scale." "That the contour lines should be instrumentally traced with accuracy, and "the system of interpolating contour lines should be abandoned. That contour

Blue Book, pp. 364 to 368.

"lines selected from those obtained from the large surveys would be a useful "addition on the one-inch map." This Commission further recommended, "That in those districts to which the large scale of 24 or 26 inches to the mile "is already applied, it would be most desirable that a reduction should be "made and published on the six-inch, or some intermediate scale between the "large plans and the one-inch map."

Your Committee have it in evidence given by the Superintendent of the survey, that the orders under which the Ordnance Survey is now proceeding are in conformity with the recommendations of the Committee of 1853, and of the Commission of 1854, of which Lord Ellesmere was the Chairman; and having also before them the letters of several practical engineers* who have made use of the Ordnance maps, all bearing testimony to the value of the contours with "bench "marks" on fixed objects for almost all engineering purposes;—they are of opinion that the weight of evidence greatly preponderates in favour of the system of contouring now in operation, and which is working satisfactorily.

Your Committee think that in such an important matter, purely financial considerations ought not alone to prevail; but having satisfied themselves that a national survey, if conducted on proper principles, will go far to reduce, if it will not wholly repay, the original cost of publication, they have come to the conclusion that the expense incurred would prove a beneficial application of public money; and they feel that Colonel James's recommendations, backed, as they are, by the opinion of a great number of eminent men, are those which they can reasonably and safely propose for the adoption of your Honourable House.

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* *See* the letters in the Appendix from Mr. J. Parkes, and Messrs. Pack, Son & Gurlick.

6 *May* 1856.

PROCEEDINGS OF THE COMMITTEE.

Martis, 6° die Maii, 1856.

MEMBERS PRESENT:

Lord DUNCAN in the Chair.

Lord Elcho.	Mr. E. Ellice.
Captain Leicester Vernon.	Mr. Baxter.
Mr. Lloyd Davies.	Mr. Stirling.
Mr. Dunlop.	Marquis of Stafford.
Mr. E. Denison.	The Lord Advocate.

REPORT proposed by the Chairman, read 1°, as follows:

"Your Committee report to the House that they have been much assisted in the course of the present Inquiry on the Ordnance Survey of Scotland by the large and valuable body of evidence collected by the Treasury during the time when Lord Elcho was in office, and presented in 1853 and 1854 to both Houses of Parliament by command of Her Majesty. That evidence has been collected in the shape of replies to Treasury Circulars, and it contains the written opinions dispassionately given of a large body of the most eminent, scientific, and professional persons in the Kingdom, and indeed of almost all those who are most qualified by their experience and attainments to speak with authority on the important subject of a National Survey. Your Committee have also received great assistance from the important witnesses who have been examined. The value of such evidence can only be duly appreciated by a perusal of it. Your Committee felt that it was their duty to sit *de die in diem*, and thus avoid unnecessarily occupying the time of the officers at present actively engaged in the Government departments and in the Ordnance Survey by a protracted investigation.

"It appears, from the evidence taken before this Committee, that when the Ordnance Survey was first undertaken in 1784, it was merely intended to produce a military map of the southern counties of the Kingdom, but that as the work advanced it came into general favour as a road map, a travelling map, a county map, and general geographical map; that so it continued till 1824, when Lord Monteagle and the Irish Members of Parliament came to the conclusion that it would be advisable, in the adaptation of the National Survey to Ireland, to secure some further social advantages, and especially to make it subservient to the proper assessment and collection of the grand jury cess and other local taxes in that part of the kingdom; that a Committee of the House of Commons sat in 1824, of which Lord Monteagle was Chairman, which recommended a ownland survey of Ireland on a scale of six inches to a mile; that a six-inch scale was accordingly adopted; and that when a portion of Ireland had been completed, the Government was further induced to extend the details of the survey from the boundaries of townlands to the subdivisions of fields. Q. 2.

"In 1840 all England, with the exception of the six northern counties, had been surveyed on the scale of two inches, and published and engraved on the scale of one inch to a mile; and a small portion of Scotland had been previously surveyed on a similar scale.

"When the survey came to the six northern counties, it was found that those thickly peopled manufacturing, mining, and colliery districts could not be properly represented on the one-inch scale; representations as to the utter impossibility of mapping those districts on that scale, even so that they might be easily distinguished by a magnifying glass, were made by geological and various scientific and other societies and individuals; and the Treasury, acting in accordance with the advice of the Duke of Wellington, recorded a Minute, dated 1st October 1840, in which, after a full explanation of the subject, it was stated that 'My Lords being of opinion that if the nation incurs the cost of a survey, that survey ought to be of a kind most generally useful, they have no hesitation in giving their consent to the remainder of England and the whole of Scotland being surveyed on the Irish scale of six inches to a mile.' Q. 2. Blue Book on the Ordnance Survey, 1854, p. 15.

"Your Committee find that the Survey of Scotland was suspended in 1828, in order that the Survey of Ireland might be proceeded with; that previously to that suspension, the county of Wigton, and one-half of the counties of Ayrshire and Kirkcudbright, had been surveyed and drawn for the one-inch scale; and that on the completion of the survey Papers on the Ordnance Survey, page 11.

of Ireland in 1840, the Survey of Scotland was resumed on the six-inch scale, which had been found of such great value in the Survey of Ireland. Thus the work which had been previously done on the one-inch scale was unfortunately thrown away; and the distinction between the peculiar advantages of a six-inch survey, as applicable to the townlands of Ireland in comparison with the larger territorial divisions of Great Britain, which is fully
Q. 284. explained in the evidence appended to this Report, was not at that time sufficiently taken into consideration. Your Committee find that the survey was proceeded with in the three counties of Wigton, Kirkcudbright, and Edinburgh, which were accordingly mapped and engraved by the Ordnance on the six-inch scale.

"In 1849, the subject of the Ordnance Survey of Scotland was brought under the notice of the Select Committee on Ordnance and Army Expenditure, of which Lord Seymour was Chairman; that Committee had before them the entire estimate of the Survey of Scotland, but the only recommendation they made was, that the survey of the towns should take precedence of the survey of the rural districts; which recommendation was complied with.

Q. 5. "The next step of importance was Lord Elcho's Committee on the Scotch Survey, which sat in 1851. The state of the case as regards Scotland then was, that a six-inch map had been resolved upon, but no one-inch map. The question before the Committee was simply whether they would have a six-inch map or a one-inch map. An alternative between those two maps was the only question proposed to them, and they pronounced in favour of the inch map, on the ground that it was better adapted to geographical purposes. The Committee also appears to have acted under a general impression, that by dispensing with the six-inch scale, the one-inch scale would be more speedily proceeded with.

Q 17. "Orders were given by the Treasury and Ordnance in conformity with the Report of that Committee. Lancashire, Yorkshire, Kirkcudbrightshire, and Edinburghshire being nearly finished, were ordered to be completed on the six-inch scale; and the remaining four counties of England and the rest of Scotland were to be done on the one-inch scale.

Q. 22. "These instructions produced the greatest dissatisfaction in Scotland and in the unsurveyed portion of England.

Q. 22. "Consequently, in 1852 and 1853, numerous representations were received from Commissioners of Supply, Royal Burghs, and various bodies in Scotland, and from the magistrates and others connected with the colliery and mining interests in the north of England, the object of which was to induce the Treasury to rescind the orders which had been given in
Q. 20. accordance with the recommendation of the Committee of 1851 in favour of the six-inch scale. Some of these memorials were referred to the Board of Ordnance by the Treasury in June 1852; and a determination was come to by those departments that the survey of Fife, which was at that time going on, should be conducted on the six-inch scale, and that
Q. 26. the question of the scale as to the rest of the country should be reserved for future consideration. Meanwhile the desirableness of an increased scale was much discussed by professional persons, and a more mature knowledge of the subject was arrived at.

Blue Book, p. 19. "In February 1853, Lord Elcho, who was then a Lord of the Treasury, drew up a very able memorandum on the survey, which, with numerous letters on the subject, was trans-
Page 53. mitted, with the Treasury circular letter of the 16th April 1853, to a large number of the most experienced and scientific societies and persons in the kingdom, requesting them to state their opinion on the comparative merits of a six-inch as contrasted against any larger scale, for the purposes of a national survey; it being understood that the inch scale would under any circumstances be proceeded with. The majority of the replies received having been decidedly in favour of a larger scale, a second circular was, on the 16th of January
Page 225. 1854, addressed to the same parties, requesting them to state what scale they would recommend.

Page 343. "These replies were, by a Treasury Minute, dated June 13, 1854, submitted to a Committee consisting of Sir John Burgoyne, Mr. Blamire, and Mr. Rendel, with instructions to report the result of the answers to the Treasury Circular of 1853.

Page 343. "Sir John Burgoyne, Mr. Rendel, and Mr. Blamire unanimously reported that the weight of the evidence in the printed correspondence before them was decidedly in favour of the scale of one two-thousand-five-hundredth part of the linear measure of the ground to be mapped (popularly termed the 25-inch or one square inch to one acre scale).

Page 344. "Under these circumstances, the Treasury determined, by a Minute, dated July 15th, 1854, 'That the surveys of Ayrshire and Dumfries-shire should be laid down and drawn 'on paper on the scale recommended by the Committee, *i. e.* of one two-thousand-five-'hundredths of the linear measurement of the ground; also, that until a final determination 'should be arrived at as to the scale upon which the Ordnance Survey should be conducted 'and engraved, the course which has been authorised in reference to Ayrshire and Dum-'fries-shire should be applied to other districts.'

Q. 633. "Your Committee find that Colonel James, the present superintendent of the survey, to whose ability and proficiency testimony has been borne by Sir Roderick Murchison, Sir
Ordnance Survey, 1855, p. 1. C. Trevelyan, Sir John Burgoyne, Mr. Stevenson, Colonel Dawson, and other witnesses, was first employed as a director of the Ordnance Survey in 1854.

"On

"On the 18th of May 1855 the Treasury recorded a Minute, founded on a Report and Memorandum submitted to them by Colonel James, in relation to the engraving of the Ordnance Survey of Scotland, which required immediate steps to be taken, in which their Lordships stated that they have arrived at the following conclusions:

"1. That it is unnecessary to have plans of the Highlands and uncultivated districts on the scale of one thousand two-five-hundredths, and that the superintendent of the survey should exercise his discretion as to the districts, the plans of which are to be made on that scale.

"2. That plans on the one two-thousand-five-hundredths scale should not be engraved, but that copies, when wanted, should be made by the anastatic process.

"3. That the Highland and other partially cultivated and thinly peopled districts should be drawn on the scale of six inches to a mile, and copies, when wanted, should be furnished by the anastatic process.

"4. That the general map of Scotland on the scale of one inch to a mile should be proceeded with as rapidly as possible.

"5. That the plans of towns containing more than 4,000 inhabitants should be drawn on the scale of one five-hundredths linear measurement.

"And on the 1st August 1855, Lord Panmure (who sat on the Committee of 1851 as Mr. Fox Maule) addressed a letter to the Treasury, in which he states his opinion that however necessary it may be to delineate a portion of the country on the 25-inch scale, such an enlarged map should not supersede the production of a map from the same survey on the scale of six inches to one mile for the same districts uniformly with those parts of the country which are laid down on the last-mentioned scale only. Appendix.

"It will be found, from the evidence of Sir Charles Trevelyan, that the only question raised before the Committee in 1851, was between the comparative advantage of a six-inch map and a one-inch map; and that the more important question as to whether a national survey undertaken on a scale sufficiently large for general and national purposes should be adopted, does not appear to have been taken into consideration by that Committee, nor is any reference made to that part of the subject in their Report. Q. 7.

"Your Committee find that since the Ordnance Survey has been undertaken, and general attention has been more immediately directed to its object, there has been a gradual progress of public opinion in favour of conducting it on a larger scale of 25 inches to a mile, equal to one inch to an acre. This has been most ably explained by Sir Roderick Murchison, Sir John Burgoyne, and Sir C. Trevelyan, who all concur in stating that the further the larger survey has proceeded the more they have become prepossessed in its favour. It is likewise worthy of observation that at Aldershot, Portsmouth, and in several places in the south of England previously surveyed on the one-inch scale, a re-survey on a scale of 25 inches to the mile has been found essential for military purposes. Q. 8. Q. 586. Q. 616. Q. 622.

"Your Committee find that the idea of a cadastral survey of 25-inches originated with Delambre and Laplace in 1793. A commission, of which they were members, recommended it to Napoleon in 1807, who adopted it, and carried out the survey of France upon that scale with signal success. It appears, from a Paper laid before the Committee, that the proposal to adopt the 25-inch scale in Great Britain originated with Colonel Dawson, attached to the Tithe and Inclosure Commission, who stated that had his suggestions been adopted in 1837, when the one-inch Ordnance maps were found utterly inapplicable to and useless for the purposes of the Tithe Commission, an expense of 3,529,830*l.* might have been saved to the country, besides a further considerable outlay in respect of surveys for roads, canals, water supply, and the sale and transfer of property, which he has no means of estimating. Q. 729. Q. 281. Q. 284. Q. 271. Appendix.

"Very valuable evidence has been given by the Lord Advocate of Scotland as to the effect of the adoption of a survey on the 25-inch scale, on mortgages and transfers of landed property. It will be found that the Lord Advocate confined his evidence to the facilities that would be afforded to this important class of transactions by correct maps of property, published and circulated under the authority of the Government; that he stated that, in his opinion, the depositing of such maps might be available to supersede descriptions of property; that the system of registration of deeds now in force in Scotland affords peculiar facilities for such a system; and in his own words, that 'he is perfectly satisfied that in 10 or 20 years, although conveyancers would, in all probability, keep up descriptions, as lawyers do, for greater safety, yet he thinks that that system might be gradually dispensed with.' Such an opinion, coming from so high a professional source, is well worthy of consideration. Q. 626. Q. 642.

"Your Committee would next advert, in confirmation of the advantages pointed out by the Lord Advocate, to the evidence of that distinguished engineer, Mr. Vignolles, who stated that in Bavaria, where he has been extensively employed in surveying, all transfers of land are made by cadastral maps, on a 25-inch scale; that no practical difficulties occur in the use of these maps, and that he does not believe that there would be any difficulty in applying a similar system to Great Britain; that it would be necessary to re-register property transferred in this manner, when it was subdivided and sold in separate lots, but that in Scotland, where every conveyance and transfer of property is registered, every difficulty Q. 840. 843. Q. 851. 857.

would be obviated by employing the same officers who are employed in registering deeds, to register the plans also; that the greatest advantages have been practically derived by
Q. 853. him, as a civil engineer, from maps similar to those proposed to be made from the Ordnance Survey of Scotland, specimens of which were hung up in the committee-room, and which are similar to those in general use in Bavaria, Baden Baden, and Switzerland.

Q. 356. "Your Committee examined most carefully into the estimates and probable cost of the survey, as proposed by Colonel James; and found that after a year-and-a-half's experience, his original estimates are fully borne out and confirmed in practice, and that a sum of 917,000 *l.*, of which 284,000 *l.* has been already expended, will cover every expense attendant on the 25-inch cadastral survey of Scotland, including the publication of maps on the reduced six-inch and one-inch scales.

"That for the six-inch survey alone, 817,000 *l.* would be required, including the publication of the maps, and for the one-inch survey alone 250,000 *l.*, including the publication
Q. 40. of the maps. That the difference of the cost of surveying between the 25-inch and 6-inch
Q. 367. 379. surveys would be comparatively immaterial, and that the recent introduction of the anastatic and photographic processes, the substitution of piece-work for day-labour, and many other improvements detailed in the evidence, will lead to increased economy in producing reduced
Q. 391. maps from an enlarged survey.

"It also appears that 76,000 *l.* has already been paid back into the Treasury for maps sold, and that the Treasury are now realising 4,000 *l.* annually from the sale of Ordnance
Q. 391. maps; that one year more will pay off the cost of engraving Ireland, and that a few years more will repay the cost of engraving Scotland; and that the superintendent of the survey finds, from experience, that as regards the 25-inch maps, 33 copies taken by the anastatic or zincographic process will repay the entire cost of production, and that he feels quite confident that if his suggestions with regard to the publication of the 25-inch scale map are followed, the entire cost of the publication will be eventually repaid at no distant period.

Q. 435. "Of the 917,000 *l.*, deducting 284,000 *l.* already expended, there remains a sum of about
Q. 438. 633,000 *l.* required to complete the survey of Scotland in the manner proposed. That sum of 633,000 *l.* would be spread over 10 years, thus making an annual vote required to complete the survey of Scotland, on the most approved principles, of 63,000 *l.* a year.

"In Ireland a six-inch map and a one-inch map will have been obtained at an expense of 1,293,014 *l.*

"In England and Wales a one-inch map has been obtained, exclusive of the six northern counties, at an expense of 989,219 *l.*

Q. 510. "England and Wales together are estimated to contain about 60,000 square miles, Scotland about 30,000 square miles, and Ireland about 30,000 square miles.

"The survey of Scotland, conducted and completed in the manner recommended by Colonel James, can therefore be produced for about 300,000 *l.* less than the survey of Ireland has cost.

Q. 517. 732. "Your Committee concur in the opinion expressed by Sir John Burgoyne, Sir C. Trevel-
Q. 869. lyan, Mr. Stephenson, Colonel James, Mr. Sopwith, &c., that the question before the
Q. 47. Committee is not one which is to be considered solely on a financial basis. Whatever the first outlay may be, it may hereafter be found, as has proved to be the case in France, that it is more economical in the first place to produce a large cadastral map, from which other maps
Q. 47. on smaller scales can be reduced at a trifling expense, than to re-survey the ground, as has been the case both in England and Scotland, owing to the insufficiency of the primary or parent survey.

"Your Committee would next advert to the delay in executing the Ordnance Survey, which has been justly complained of by many of the witnesses examined. It appears that this delay, which extended to about 20 years, has been partly caused by the transfer of the whole of the Ordnance surveying staff to Ireland in 1827; a circumstance which, as it has been proved by the evidence to have been attended with vast advantage to Ireland, Your Committee cannot for a moment regret. They find, however, that there have been other delays, occasioned by the want of a definite idea of what sort of a survey is required, which have been productive of much unnecessary labour, confusion, and expense.

"The time has now arrived when it is absolutely necessary for Parliament to consider, and finally determine, the comprehensive question, What is the nature of the survey which they are prepared to sanction as the one which will most conduce to the general interest of the nation at large?

"Your Committee have come to a decision in favour of the $\frac{1}{2500}$ scale for a cadastral survey of the country. In doing so, they are influenced by the great advantages which may be anticipated from the prosecution and completion of such a national work on principles which have been already successfully acted upon in the surveys of France, Bavaria, Switzerland, and other countries in Europe.

"Of the purposes which national survey ought to subserve, some of the principal appear to be—

"1. The registration of titles.

"2. The simplifying and cheapening conveyances of land, deeds of sale, leases, and all transfers of landed property.

"3. Local

" 3. Local valuation and assessments.
" 4. Adjustment of civil and ecclesiastical divisions.
" 5. Inclosure of waste lands.
" 6. Sanitary purposes.
" 7. Statistics.
" 8. Parliamentary purposes, in reference to Standing Orders.
" 9. Geological and mineral surveys.
" 10. General drainage, water supply, and engineering purposes.
" 11. Military and purely scientific purposes.

" To secure such advantages as these, it is essential that a national survey should be conducted on a scale which, at the same time that it is susceptible of reduction for geographical uses, is also large enough to be available for general purposes of utility to all classes of the nation.

" It will be found from the evidence that the partial prosecution of the survey on a large scale has already produced the most important scientific and practical results.

" It has been proved that, unless the survey is carried on on a scale large enough to admit readily of the insertion of all the names and places in the populous mining and manufacturing districts, the attainment even of a correct geographical map is always difficult, and in many cases entirely impracticable. It has also been established that areas cannot be accurately measured from the paper (which is the real test of the practical usefulness of a cadastral survey) on a scale of less than 24 inches.

" The Committee would next advert to the fact, that while it is possible to reduce, it is impossible to enlarge, a parent map. A survey conducted on a small scale is liable to error, and the error, however small, if magnified even by the stretching of paper or other accidental causes, may be and has been productive of serious consequences; they have therefore recommended the completion of the Ordnance Survey of Scotland on such a scale and in such a manner as will secure the greatest accuracy and uniformity on the one hand and make the most of the work that has been already done and engraved on the other.

" Thirteen counties in Scotland have been already surveyed. Those comprehend, with the exception af Lanarkshire, Perthshire, Aberdeenshire, Forfarshire, and a few of the north-eastern counties, by far the most important of the populous and cultivated districts, to which alone the survey on the 25-inch scale is to be limited. It is admitted that, under any circumstances, a map of the Highlands, published on a one-inch scale, must be produced.

" On examining the estimates, it will be found that the plan recommended by the Committee, which will be completed for 633,000*l.*, includes an estimate for a reduction to and publication of the Ordnance Survey on both the six-inch and one-inch from the 25-inch scale. Now, the production of a one-inch Ordnance map of the whole country as speedily as possible is an essential part of the plan. It is admitted that, for the sake of accuracy, the survey for a map on a one-inch scale must be conducted on a larger than a one-inch scale; and as no unnecessary delay can occur by adopting the six-inch as the intermediate scale for the production of the one-inch map, Your Committee recommend that it should be proceeded with. The plans on the 25-inch scale, though admirably adapted for the purposes above mentioned, are too large for use out of doors. Contoured maps for engineering, geological, and several other purposes, on a uniform and intermediate scale between the 25-inch and the one-inch, are required. Such maps can be sold at a price which will cover the entire cost of making them, and they will be found of great value as maps of reference for many public as well as local and private purposes. Your Committee think, besides, that it would not be real economy to incur the expense of a national survey without, by the publication of such maps, deriving the utmost advantage from it. The completion of the publication of the six-inch maps is necessary to render the survey uniform in both the Highland and Lowland districts.

Appendix, No. 2, p. 118.

" Even for those who may doubt whether, in the first instance, a survey founded on the cadastral 25-inch and intermediate six-inch scale is the very best that could have been adopted for Scotland, yet, adverting to the fact that five counties have been already surveyed on the 25-inch scale, that eight counties are actually engraved on the six-inch scale, and that more are in progress, it is a matter for consideration whether, under these circumstances, it may not be wise to execute, at the further outlay of 633,000*l.* in 10 years, a survey of Scotland on principles on which similar national works have been performed with success in other countries in Europe.

Q. 887.

" Your Committee have had under their consideration the several methods which have been recommended or adopted for ascertaining and recording levels, viz., by levelling the sides of each triangle, as was first done in Ireland, by which method the heights of definite points on the summits of the hills, and the height at which every line crosses the roads or streams is given, or by means of contours at given altitudes, following all the sinuosities of the ground, and 'bench marks' on fixed objects on the main roads, and other permanent surfaces.

" This subject has been under the consideration of other Committees of the House of Commons, and of a Special Commission composed of distinguished scientific gentlemen.

Parliamentary Paper, 921, Sess. 1853.

"The Committee of 1853, on the Map of Ireland, in their Report, say, that 'in order to render the general map of Ireland, reduced to the scale of one inch to a mile, as extensively useful as possible both to the public and to scientific men, and at the same time worthy of the great survey upon which it is based, the delineation of the hills and vallies should be grounded upon contour lines ascertained from actual survey, and they consider it highly desirable that such a number of those lines as may be found suitable to the scale on which the map is based, should be actually exhibited thereon.'

Blue Book, pp. 364 to 368.

"The Commission of 1854, of which the Earl of Ellesmere was Chairman, had under their special consideration 'the advantage of applying a system of contouring to the Ordnance maps;' and they recommended 'that levels should be taken on certain principal lines, and at defined prominent points.' That these levels would be more practically useful when given upon roads, railways, and canals, or bridges, milestones, churches, &c. That contour lines to a certain extent would be a useful addition to a map on the six-inch scale.' That the contour lines should be instrumentally traced with accuracy, and the system of interpolating contour lines should be abandoned. That contour lines selected from those obtained from the large surveys would be a useful addition on the one-inch map.' This Commission further recommended, That in those districts to which the large scale of 24 or 26 inches to the mile is already applied, it would be most desirable that a reduction should be made and published on the six-inch or some intermediate scale between the large plans and the one-inch map.'

"Your Committee have it in evidence, given by the Superintendent of the survey, that the recommendations of the Committee of 1853, and of the Commission of which Lord Ellesmere was the Chairman, are in conformity with the orders under which the Ordnance Survey is now proceeding. This circumstance alone would be sufficient to induce them to hesitate before recommending any further changes in the mode of conducting the survey; but when, in addition to the above consideration, they have before them the letters of several practical engineers* who have made use of the Ordnance maps, all bearing testimony to the value of the contours with 'bench marks' on fixed objects, for almost all engineering purposes, they earnestly recommend that the system now in operation, and which is working satisfactorily, should not be disturbed.

"Your Committee think that in such an important matter as a national survey, purely financial considerations ought not alone to prevail; but having satisfied themselves that a national survey, if conducted on proper principles, will more than repay the original cost of publication, they can come to no other conclusion than that the expense incurred would prove, as regards both the present and the future, a wise investment of public money. And they feel that Colonel James's recommendations, backed, as they are, by the opinion of a great number of eminent men, are those which they can reasonably and safely propose for the adoption of your Honourable House."

Report proposed by Mr. *Edward Ellice* read 1°, as follows:

"Your Committee, before entering upon the question more especially referred to them, think it right to state the following circumstances in connexion with the past history of the Ordnance Survey of Scotland:

Q. 284. 504. 519 to 527. (0.52) p. 12.

"That survey, commenced in 1819, was conducted upon a scale of one inch to a mile, up to 1827. It was then suspended, the county of Wigton, and one half of the counties of Ayr and Kirkcudbright alone, having been completed.

"In 1840 the survey was resumed, when the one-inch scale was abandoned in favour of that of six inches. The previous surveys of Ayr, Wigton, and Kirkcudbright, the maps of which were lying in the Ordnance Office ready for engraving, were thus rendered useless, and the survey was recommenced *ab initio*, upon the larger scale.

Q. 519 *et seq.*

"So recommenced, it seems to have made little progress in succeeding years. Only the counties of Wigton, Kirkcudbright, and Edinburgh had been surveyed in 1851, when, in consequence of the general complaint against such dilatory proceedings, a Committee, of which Mr. Charteris (now Lord Elcho) was Chairman, was appointed to inquire into and report upon the whole subject.

Q. 17. (0.52) p. 12.

"In their Report, dated 10th July 1851, that Committee came to the unanimous conclusion, that the scale of six inches and the system of contouring ought to be abandoned. They recommended, upon the ground of practical utility, the vigorous prosecution of a map upon the one-inch scale, which, as compared with the larger survey, would effect a saving of no less than 500,000*l.*, upon an estimate of 750,000*l.*

Q. 8.

Upon the 21st of October following, the Treasury passed a Minute concurring in the course recommended by the Committee as "*the best for attaining the objects in view, and at the same time effecting a considerable saving of expenditure.*"

"But these views of the Treasury soon underwent a material change. The Ordnance department, whose representatives had throughout strenuously opposed any limitation to their proceedings,

* *See* the letters in the Appendix, from Mr. J. Parkes, and Messrs. Pack, Son & Gurlick.

proceedings, but whose opinion the Committee of 1851 had, after much patient investigation, seen reason to overrule, urged its objections more successfully upon the Treasury than upon the Committee; and a second Minute, on the 16th of December following, was the consequence. That Minute modified the previous instructions, so far as to allow the survey of those counties already commenced upon the large scale to be completed on that scale. Q. 8. Q. 16.

"In 1852 a further modification took place in the views of the Treasury; and in the month of June another Minute authorised the extension of the large scale of six inches, including contouring, to the counties of Fife, Haddington, and Kinross. Q. 26. Page 12 (0.52).

"In 1853 the subject was resumed in a memorandum, dated 10th February, drawn up by Lord Elcho, then one of the Lords of the Treasury. Lord Elcho there says, that his own opinion as to the soundness of the views of the Committee of 1851 remained unchanged, but that since the time of that Report, too much had been conceded to admit of still further concessions being withheld. He goes on to refer to much larger scales than any yet attempted, and suggests one of 26¾ inches as that best adapted for correct plans of estates, and for other civil purposes. Correspondence, p. 21. Correspondence, pp. 22, 23.

"In this dilemma, a private circular, signed by Sir Charles Trevelyan, was sent on the 22d February to certain scientific persons, asking their opinions as to the best course to be adopted. But, in the meantime, another Treasury Minute was passed authorising plans of the cultivated districts of Ayrshire and Dumfries upon the extended scale of 25 inches. Correspondence, p. 27. Q. 29.

"The replies to Sir Charles Trevelyan's circular indicated considerable difference of opinion; a variety of scales was recommended; and, consequently, another circular was issued on the 16th of April, enclosing the previous correspondence, and canvassing more generally for opinions to guide the Treasury. A further circular was afterwards issued to the same effect. Correspondence, p. 53. Correspondence, p. 225.

"In 1854, by the month of June, the whole of the replies to the various circulars were received. Those replies in their turn were submitted to a committee of three gentlemen officially connected with Government; and those gentlemen reported that the opinions expressed in the documents referred to them preponderated in favour of a survey and plans upon the scale of 25 inches. Correspondence, p. 343.

"Upon the receipt of that report, the Treasury passed a Minute, authorising generally the 25-inch survey "*until a final determination shall be arrived at.*" Correspondence, p. 344.

"The continuance of contouring seems to have been also authorised as part of the whole system. Q. 27.

"Up to this time, it does not appear that since the Report of the Committee of 1851 any communication upon the subject had been made to Parliament beyond the publication of part of the correspondence in 1853. The Report of the Committee had been ignored, and the commencement of a much larger expenditure than had ever before been contemplated had been authorised by the Treasury; yet no explanation seems to have been offered when the Estimates were moved for and voted.

"But great confusion existed in the surveying operations; different scales were being applied to different counties; the Ordnance had actually to pay back to the Treasury part of the money they had received, and which, owing to contradictory instructions, they could not apply*; and, under the necessity of coming to some final determination, the Treasury, in September 1854, published the whole of the official correspondence that had taken place. Q. 469.

"This gave rise to discussions upon the Estimates in the ensuing Session of 1855. Lord Seymour, objecting to the introduction of the 25-inch scale, moved a reduction of the vote for the survey of Scotland, but consented to withdraw his amendment on the assurance which Lord Palmerston gave that nothing should be done upon the large scale, except in Ayrshire and Dumfries, until the experiment in those counties was concluded, and that the money not required for that experiment should be expended upon the one-inch map, which, under any circumstances, all were agreed should be published. Notwithstanding this assurance, however, the Treasury subsequently passed a Minute, dated 18th May, finally authorising the 25-inch survey; except in the case of waste land, to which the six-inch scale was to be applied. This decision involved an estimated expenditure of 917,000*l.* (0.52) p. 12. (0.52) p. 1.

"Your Committee have further to state, in connexion with this part of the subject, that, owing to these constant changes of instructions in conducting the survey since 1851, there has been in point of time a loss of no less than two out of five years, while the loss in money entirely thrown away has been 25,000*l.* Q. 912. 938.

"They

* Colonel James says, in a Memorandum, dated 22 March 1855,—"Whilst Parliament was increasing the grants for the survey, and the Ordnance was proportionally increasing the surveying force to enable them to carry on the work with greater rapidity, *fifteen months elapsed between the 15th April 1853 and the 15th July 1854, before orders were given to draw the plans upon any scale.*"

" They also find that the actual survey since the Report of the Committee of 1851 has cost, upon an available expenditure of 83,650*l.*, just 57,750*l.* more than it would have cost had the recommendations of that Committee been sustained by the Treasury.

Q. 935. 936. Q. 937. " Your Committee have considered it necessary to state these facts, in order to show how absolutely essential it is, whatever may be decided upon as to the future, that instructions should now be given upon some permanent and intelligible basis that cannot be departed from without the knowledge and consent of Parliament. Unless this course is adopted, Your Committee, judging from the past, can feel no confidence in the steady prosecution of an uniform system of survey, the constant departure from which has already exposed the public to such serious loss and inconvenience.

" With these preliminary observations, Your Committee will proceed to the matter more immediately referred for their consideration.

" They find that the present inquiry differs materially in its object from that of 1851. It was then merely a question of comparison of scales for geographical purposes. To this has now been added the much wider subject of a national survey of the kingdom for property purposes.

" With regard to a map for geographical purposes, and those of general and convenient reference, it seems admitted on all sides, now as on the former occasion, that a one-inch map is the most perfect that can be produced. This, too, has been proved by experience in the case of the one-inch Ordnance maps of England, as compared with those of Ireland and part of Scotland, on the scale of six inches. Your Committee have no difficulty in arriving at the conclusion, that the publication of a uniform map of Scotland upon the one-inch scale, at the earliest possible period, is a matter of public necessity.

" The other point, relating to a property survey, is not so easily disposed of.

" It is proposed to survey the whole country upon such a scale (25 inches to a mile) as may present to every proprietor an accurate plan of his estate. Of course no plan upon so extensive a scale would convey to the mind any idea of the physical features of the country. Representing with extreme accuracy the exact area of every field and inclosure, the quantity of paper covered by the different plans of a single parish would be much too large to join conveniently into one connected plan; and hence such a survey must be held as available only for purposes strictly confined to each particular locality.

(0.52) p. 16.

(0.41) Colonel James's Letter, 30 June 1855.

Q. 599. " There being no precedent for the authorised publication of an uniform national survey of such a description, Your Committee are limited to the evidence and documents produced before them, whereon to found an opinion.

Q. 32. 38 *et seq.* Q. 168 *et seq.* Q. 626. " On the one hand, it is represented that such a survey would, for all local taxation affecting land, for the valuation and transfer of landed property, for all purposes connected with agricultural statistics, and for mining and geological operations, be of considerable value; that on this account it is a matter of public interest.

Q. 804. 808. Q. 724. " On the other, it is confidently asserted that these advantages are overrated: that on so large a scale the most minute subdivisions of land, the breadth of hedges and roads, the sinuosities of small streams, the particular shape and forms of buildings must be accurately delineated: that all these are subjects of constant change and alteration, and, therefore, that it would be impossible to trust to any plan of the kind as a public record, unless subject to constant revision under public authority. It is further urged, that the public, as a whole, have little or no interest in a survey for special local purposes, and that even as regards landowners one uniform scale would not be suitable for all conditions of property. For mining purposes a 25-inch scale would be infinitely too small.

Q. 124. Q. 796, 797. 811. 802. Q. 686. 688.

" Your Committee upon these conflicting statements have difficulty in giving a decided opinion as to the amount of benefit to be derived from a property survey. That there would be some advantage is undeniable, but to what extent seems problematical. This point, however, is incontestible—that any lasting advantage must entirely depend upon the consent of Parliament to keep up as a permanent addition to the establishment of the country a staff of surveyors exclusively employed in the constant revision of these property plans. Such revision involving fresh surveys, must necessarily be maintained, otherwise, looking to the never-ceasing change in the subdivision of land, and disposition of buildings, from either natural or artificial causes, the plans would within a very few years become valueless as public records. They would represent as facts things that no longer existed, and would tend to mislead rather than to assist.

Q. 113. 124. Q. 802. Q. 815. Q. 816.

Q. 804. " There are other considerations connected with this subject. The question of a property survey affects a much wider field than Scotland. Sir Charles Trevelyan contemplates that, once adopted in Scotland, it should be extended to the whole Kingdom. This would involve the re-survey of England and Ireland.

" The expense of such an undertaking is serious. The estimated cost of the large survey of Scotland alone, including the re-survey of those parts already completed on a smaller scale, is 917,000*l.* No accurate estimate has been given of the re-survey of England and Ireland, but it seems that the whole outlay upon the United Kingdom cannot safely be taken at less than 4,000,000*l.* or 5,000,000*l.* This is exclusive of the annual cost of any permanent

permanent establishment for the purposes of revision; but as so much against that item may be placed whatever sum may be produced by the annual sale of maps.

"Looking to all these facts, and conceiving that the question of a property survey must be decided not with reference to Scotland alone, but with regard to the whole Kingdom, Your Committee are not prepared upon the evidence before them to make a partial recommendation upon the subject.

"With respect to an intermediate scale of six inches and the system of contouring, Your Committee have received no evidence to lead them to doubt the correctness of the conclusion come to by the Committee of 1851; on the contrary, that decision has been strenghtened by corroborative evidence on the present occasion. It only requires an inspection of the six-inch plans of the Island of Lewis to satisfy any one of the utter uselessness of such a survey of the Highlands; while in the Lowlands it has no practical advantages to justify the expenditure it would require. If the six-inch scale is abandoned, the system of contouring falls to the ground.

Q. 200 *et seq.*
Q. 702 *et seq.*
Q. 662. 785.
Page 8 (0.52).
Report, 1851; 331. 107. 1927 to 2013. 397.
Q. 586. 608.
Q. 572. 579.
Correspondence, pp. 357. 365, 366.

"Your Committee therefore recommend,—

"1. That the six-inch scale and the system of contouring should be abandoned.

"2. That the survey on the two-inch scale should be proceeded with as rapidly as is consistent with accuracy, with a view to the publication within eight years of a one-inch map of Scotland, shaded and engraved in a manner similar to the Ordnance one-inch map of England, with the elevations given in figures.

"3. That the survey be proceeded with steadily from south to north.

"4. That the scale of Town Surveys should be left to the discretion of the Ordnance Department, having reference to particular circumstances, and to the wishes and wants of the different local authorities.

"Should the Government, with a view to public interests, think it right to recommend as a general measure, and should Parliament agree to the adoption of a system of property survey, and the permanent burden necessary to maintain its efficiency, the present recommendations of Your Committee will only be affected in point of expenditure. Whether the survey is conducted on the two-inch or the 25-inch scale, a one-inch map of the whole of Scotland can be published from either of those scales within eight years; the annual Votes being adapted to the different circumstances.

Q. 438.

"In conclusion, Your Committee have to state, that the cost of a geographical one-inch map of Scotland, including 57,750 *l.* already laid out on the larger survey, would be 307,750 *l.*, as compared with 917,000 *l.* for the property survey; showing, in the case of Scotland, a saving of 609,250 *l.* in favour of the one-inch map. Evidence has been given on the part of the Ordnance, that by the anastatic process much of the expense of engraving may be avoided, and this assumed saving is taken for granted in the above estimates."

Motion made, That the Report proposed by the Chairman be now read 2°, paragraph by paragraph. Question put; the Committee divided:—

Ayes, 7.	Noes, 2.
Lord Elcho.	Mr. E. Ellice.
Captain Leicester Vernon.	Mr. E. Denison.
Mr. Dunlop.	
Mr. L. Davies.	
Mr. Baxter.	
Mr. Stirling.	
Marquis of Stafford.	

The Report was then read paragraph by paragraph, and agreed to.

Ordered to Report.

LIST OF WITNESSES.

Martis, 8° *die Aprilis*, 1856.

Sir Charles Trevelyan, K.C.B. - - - - - - - p. 1
Lieut.-Colonel Robert Kearsley Dawson, C.B. - - - - p. 28

Mercurii, 9° *die Aprilis*, 1856.

Lieut.-Colonel Robert Kearsley Dawson, C.B. - - - - p. 36
Lieut.-Colonel Henry James, R.E., F.R.S., &c. - - - - p. 43

Jovis, 10° *die Aprilis*, 1856.

Lieut.-Colonel Henry James, R.E., F.R.S., &c. - - - - p. 57
Sir Roderick Impey Murchison - - - - - - - - p. 75
Sir John Burgoyne - - - - - - - - - p. 80
The Lord Advocate, M.P. - - - - - - - - p. 82

Veneris, 11° *die Aprilis*, 1856.

Lieut.-Colonel Robert Kearsley Dawson, C.B. - - - - p. 84
Mr. Thomas Sopwith - - - - - - - - p. 89
Isambard Kingdon Brunel - - - - - - - p. 98
Charles Vignoles, Esq. - - - - - - - - p. 102
Robert Stephenson, Esq., M.P. - - - - - - - p. 105
Lieut.-Colonel Henry James, R.E., F.R.S., &c. - - - - p. 108

MINUTES OF EVIDENCE.

Martis, 8° die Aprilis, 1856.

MEMBERS PRESENT.

Viscount Duncan.	Mr. Evelyn Denison.
Mr. Edward Ellice.	Mr. Stirling.
Mr. Lloyd Davies.	Mr. Baxter.
Mr. William Lockhart.	Captain Leicester Vernon.
The Lord Advocate.	Mr. Dunlop.

VISCOUNT DUNCAN, IN THE CHAIR.

Sir *Charles Trevelyan*, K.C.B., called in; and Examined.

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

1. *Chairman.*] WILL you state to the Committee how long you have been in your present position as Assistant Secretary to the Treasury?—I was appointed in January 1840.

2. Will you give the Committee an outline of the official course of proceeding relative to the scale of the Ordnance Survey of Scotland during the time you have occupied that position?—As the survey of England and Ireland have an important bearing upon the survey of Scotland, I will give, with the permission of the Committee, a very slight sketch of the history of the survey from its commencement. It began in the year 1784, as a military sketch map of the south of England; but as the work advanced, it came into general favour as a road map, a travelling map, a county map, and a general geographical map: and so it went on on the inch scale till 1824, when the triangulation was extended to some points in Ireland, upon which Lord Monteagle and the Irish Members of Parliament came to the conclusion that it would be advisable in the adaptation of the plan to Ireland to secure some further social advantages, and especially to make it subservient to the proper assessment and collection of the grand jury cess and other local taxes. A Committee of the House of Commons sat in 1824, of which Lord Monteagle was chairman, which Committee recommended that the scale of six inches should be adopted for Ireland, and that it should be a townland survey. I must explain that the townland of Ireland is the unit of territorial division. The original intention of the survey was, that it should be confined to an exact description of the contents and boundaries of the townlands; but as the survey of Ireland advanced, it was found to be very desirable to include the subdivisions of fields and homesteads, and that was accordingly done in the centre and southern parts of the island. When the centre and southern parts had been completed, the advantage of including the subdivisions of fields was found to be so great, that the Government was moved to extend the detailed survey to the north; that is still in progress; and it was also determined to contour the whole island. I will now return to England. As I have already mentioned, the survey of England went on on the scale of an inch to a mile, until it came to the northern counties, and then it was found that those thickly peopled manufacturing, mining, and colliery districts could not be properly laid down on the inch scale; representations were then made to the Treasury to that effect by various scientific societies, the Geological and Polytechnic Society of the West Riding of Yorkshire, the Geological Society and the Literary and Philosophical Society of Manchester, and others, and the representations made by them were confirmed by the Ordnance; it was stated that the results of the survey could

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

not be seen on the inch scale without the assistance of a powerful magnifying glass, and that it would either be necessary to omit great numbers of names, or if they were included, they would be crowded into such a small space, in such small characters, as to be quite illegible to the naked eye. At that time Mr. (afterwards Sir Henry) Delabeche was engaged in surveying the great South Wales coal field; he found the inch survey quite insufficient for his purpose, and Colonel Colby, the then superintendent of the Ordnance Survey, had, as he expressed it, to provide further geographical assistance for him. In this state of things the whole subject was referred for the advice of the Duke of Wellington, who carefully considered it, and wrote a letter to the Chancellor of the Exchequer, dated 5th October 1840, which is printed in pages 16, 17, and 18 of the Blue Book of 1854. The conclusion at which the Treasury arrived is contained in a paragraph, which, with the permission of the Committee, I will read; it is in the Treasury Minute, dated 1st October 1840, and it is to be found at page 15. "My Lords are satisfied from the consideration they have given to the subject, that the scale on which the English survey has hitherto been conducted, falls much short of what is required by the existing circumstances of the country. That scale was originally fixed principally with a view to military considerations, while the demand of the present day is for such a national survey as shall be permanently useful in aiding the improvement of the country, by serving as a basis and guide in the formation of railroads, canals, and other public works, besides assisting in the developement of the geological structure of the country, and promoting in various other ways the progress of science and statistical knowledge. Being of opinion, therefore, that if the nation incurs the cost of a survey, that survey ought to be of the kind which is admitted to be most generally useful, my Lords have no hesitation in giving their consent to the remainder of England, and the whole of Scotland, being surveyed on the Irish scale of six inches to the mile; and my Lords think themselves fortunate in having their opinion on this important subject confirmed by the concurrence of so high an authority as that of his Grace the Duke of Wellington. By this means a permanent map will be obtained, on a sufficiently large scale to admit of subsequent alterations and improvements in the face of the country being transferred to the map; and as, by placing this map at the disposal of private publishers, materials will be furnished to them for the construction of every description of maps on reduced scales suited to the public taste, it appears to my Lords that the interference of the State ought, as has been suggested by the Duke of Wellington, to stop at this point, and that it will not be necessary to put the public to the expense of having any other map engraved on a reduced scale." I wish to call the attention of the Committee to the circumstance that the principle on which the six-inch scale was resolved on was precisely the same as that on which the extension of it to the larger scale is now advocated; that is to say, that it should be a map sufficiently large and comprehensive to include the necessary aid for all social objects. I must also explain that one of the points determined upon by the Minute of 1840 was, that the State should confine itself to publishing a single map on a large scale, that is, on the six-inch scale, and that the reduction of that map and the application of it to the various wants of the public should be left to private publishers; but we have not been able to maintain that principle; the first departure from it was made with reference to the then unsurveyed six northern counties of England. It was represented that as the inch map had been published for the rest of the country, and as a number of persons had become subscribers for the whole of England, it would be necessary, as a matter of good faith, to publish the result of the survey also on the inch scale for the six remaining counties of England, so that the survey of the whole of England might be published on that scale. The next attempt at a departure from it was by the House of Commons' Select Committee of 1846, which recommended that the survey of Ireland should be published, not only on the six-inch scale, but also on the inch scale; but the Treasury resisted that proposal until the year 1852, when it was conceded, because it was represented that it was necessary, for the proper exhibition of the general results of the geological survey of Ireland, that the result of the survey should also be published on the inch scale; and as regards Scotland, the only map that was determined upon was the six-inch map, until Lord Elcho's Committee in 1852, which recommended that the inch map should be substituted for the six-inch map.

Sir C. *Trevelyan*, K.C.B.

8 April 1856.

3. Mr. *Davies.*] Will you read the passage at the bottom of page 17?—That is in the Duke of Wellington's letter. "These maps and plans should contain, besides the topographical information given in all maps, such as lines of road of all descriptions, railroads, canals, rivers, stating whether navigable or otherwise, and for vessels of what size and description, other features of the country, such as towns, villages, hamlets, the noted seats and parks of noblemen and gentlemen; the distinction of land covered with wood from other, describing the shape of the wood. These maps should indicate the general relative elevation of the country surveyed, and represented either by shadows or by numbers; the political division and boundaries of the country, such as parishes, hundreds, counties, and others locally known should be accurately ascertained and marked; and the boundaries of corporations and towns, whether fixed by custom or by Act of Parliament." Both the Treasury and the Duke of Wellington were aware that even the six-inch map would not be sufficiently large to admit of every object being included; and it was determined that, if individuals or societies should desire that the map should be still further extended, so as to include other objects, they should contribute to the expense of such extension; but that principle, also, has never been carried into effect; we have never been able to apply it. At this time the six northern counties of England were unsurveyed, except a small portion of the southern part of Yorkshire and Lancashire; and on the representation of the same scientific societies, permission was given to resurvey those portions, and lay them down on the six-inch scale, so that the whole of these counties might be published on the same scale. But there was one representation which I have omitted to notice in the proper place, but which is of so much importance that I beg leave to call the special attention of the Committee to it. In March 1839 a well-considered and able representation was received from the Highland Society, signed by the Duke of Montrose, as Vice-president; and it was referred, with the similar representations from the English scientific societies, for the consideration and report of the Board of Ordnance. It is so remarkable a document, that I beg leave to give it in as strongly recommending the six-inch scale; it had great influence in the decision, and was specially referred to in the Treasury Minute. (*The Witness delivered in the Memorial and the Minute thereupon.*) In the year 1842, a very remarkable correspondence took place on the subject of the scale of the survey. The Tithe Commissioners, in a letter to the Home Office, dated the 18th April 1842, wrote as follows: "We have reason to suppose that the Ordnance survey of the four northern counties is now carrying on, on a plan which is meant to make it available for civil purposes. We have had one, and probably shall have more, applications to delay the mapping parishes till that survey shall have been completed. We think it right to report to you that on the scale at present contemplated (that of the Irish survey), the proposed survey will be useless for such purposes as the maps supplied to us are meant to answer; and also useless, as we have reason to believe, for almost all other civil purposes, and more especially, as we find on communication with the Poor Law Commissioners, useless for the purpose of rating." The reasons given by the Commissioners appeared to Sir James Graham to be very strong; and their letter being forwarded to the Treasury, it was referred to the Ordnance for a report of the estimated expense of extending the survey of the six northern counties of England from the six-inch scale to the larger scale recommended by the Enclosure Commissioners; and the answer was, that the extension of the scale as recommended would cause an additional expense of 2*d.* an acre, amounting to 68,500 *l.* for the whole six counties; so that, for an additional expense of 68,500*l.*, we might at that time have had a three-chain map of the whole of the great six northern counties of England.

Vide Appendix.

4. Mr. *Ellice.*] Was that the expense of the survey only?—Yes; the popular name is the three-chain scale. The truth is, that all the large scales are so near each other, that they might generally be called the large scale.

5. *Chairman.*] I understand you to say that that was the period when the large scale was originally spoken of?—It was brought to the notice of the Treasury at that time, but previously to that, in 1837, when the operations under the commutation of tithes first commenced, the Commissioners made a representation to Mr. Spring Rice, the then Chancellor of the Exchequer, urging upon him the importance of having an authentic national survey of the whole country on the large scale, whereby, they said, their immediate object of commuting the tithes would be greatly facilitated; and, besides that, a most

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

a most valuable national comprehensive survey of the whole country would be accomplished. That representation was overruled, and the result was that about two millions of money was laid out on unreliable parish maps for the special purpose of the commutation of tithes, which would have been more than sufficient to survey the whole of England in an authentic manner upon the large scale. On receiving this estimate of the additional expense of surveying the six northern counties on the large scale, the Treasury made another reference to the Ordnance, requesting that " the Master-general and Board, after referring to the former correspondence on this subject, including the letter from his Grace the Duke of Wellington, the letter of this Board, dated 14th October 1840, and the representations from the scientific societies adverted to in it, will advise them whether, taking into consideration all the engineering and other civil objects in every part of the island which are likely to be facilitated by a work of this description, the enlarged scale which has been already resolved upon is sufficient for the purpose, or whether decisive reasons exist for incurring the additional expense which would attend the completion of the map on a still larger scale." In reply to that, the Ordnance sent a report from Colonel Colby, then at the head of the Ordnance, containing a very decided opinion in favour of the large scale, supported by very statesmanlike reasons. Upon that the Duke of Wellington was again consulted, and the substance of his answer was, that, without denying the superior advantages of the large scale, it was evident that if it were conceded, it must be extended to the whole of that portion of England which had been surveyed upon the small scale. Upon that, a second reference was made to the Ordnance for an estimate of the expense of resurveying on the large scale the whole of that portion of England which had been surveyed upon the small scale. The answer was 1,309,000 *l.* for the surveyed portion, and the additional 68,500 *l.* for the extension of the large scale to the unsurveyed portion, making altogether 1,377,500 *l.*; the expenditure for the much less perfect tithe maps, which cannot be converted to general national purposes, having since been about two millions. The Treasury, with this estimate before it, referred the matter to Mr. Walker, the civil engineer; and the substance of his opinion was that he saw a decided case for the six-inch scale, and he mentioned this reason: " When lately on a survey of the Dublin and Drogheda Railway, the only plans of the line which were put into my hands were sheets of the Ordnance survey, and they appeared the plans which the engineers used for general purposes; roads, rivers, and the other features of the country near the railway were shown with a correctness that was extremely useful. To have surveyed so great an extent for the purposes of that work only would have been attended with enormous cost to the projectors, and therefore it would not have been done; so that the public and the owners of property near to, though not upon the line, would not have possessed to the same extent the advantage they now do of seeing how their property would be affected by or situated in respect of the railway." But he pronounced on the whole against the large scale, mainly on the ground of the great size of the map; upon which the Treasury, in a Minute, dated the 24th of January 1843, still without denying the superior advantage of the large scale, determined to adhere to the six-inch scale mainly on the ground that if the large scale were adopted for the six northern counties, it would be necessary to extend it to all the rest of the country; in fact it was dealt with by the Treasury on a strict financial view. The next step of importance was Lord Elcho's Committee of 1851, on the Scotch survey; the state of the case as regards Scotland then, was, that a six-inch map had been resolved upon, but no inch map; it was intended to leave it to private publishers to reduce the six-inch map as they might think proper. The question before the Committee was, whether they would have a six-inch map or a one-inch map; it was an alternative between those two, and they pronounced in favour of the inch map, on the ground that it was more adapted for general purposes. The large-scale map was not then in question. I would refer particularly to page 7. These two passages contain the spirit of the report: " Experience, however, of the Irish maps appears to have proved, that whatever may be the value of the six-inch maps as local plans, a one-inch map is, for all general purposes, absolutely essential." Then again, near the bottom of the same page, it is said, " For all general purposes a map of this description is practically useless, and cannot possibly convey to the mind as accurate an impression of the physical features and general character of a country as is supplied by the Ordnance one-inch maps of England. Six-inch maps may, indeed,

more

more aptly be termed local plans;" and so on. The actual recommendations of the Committee will be found at page 12. They were, "That the six-inch scale be abandoned; that the system of contouring be abandoned; that the survey and plotting on the two-inch scale be proceeded with as rapidly as is consistent with accuracy, with a view to the publication, within 10 years, of a one-inch map, shaded and engraved in a manner similar to the Ordnance one-inch map of England, with as many elevations as possible given in figures; that the survey be proceeded with steadily from south to north, as was the original intention; that the suggestions made by Mr. Brunel be adopted." The Committee also seem to have acted under a general impression, that by dispensing with the six-inch scale, the inch scale, which was more available for general purposes, would be more speedily proceeded with.

6. Mr. *Ellice.*] I think that was consistent with the evidence, was it not?—I have no reason to doubt that it was consistent with the evidence.

7. *Chairman*] The question at that time before that Committee was between a six and a one-inch map?—Yes; it was a simple alternative.

8. And the question as to the large map was not taken into consideration by that Committee?—No. I will now proceed to state how the Treasury dealt with that Report. The first Minute recorded upon it is dated the 21st of October. After recapitulating the recommendations of the Committee, it proceeds in this way, "My Lords are disposed to concur in the opinion of the Committee that contouring should be abandoned, as regards England and Ireland, as well as Scotland, and that a survey of this nature" (that is the inch scale, as recommended by the Committee), "as regards Scotland, would best attain the objects in view, and at the same time effect a considerable saving of expenditure. Write to the Ordnance, and request that the Master-general and Board will inform them whether they see any objection to the adoption of the recommendations of the Committee. My Lords desire further to call the attention of the Board of Ordnance to the suggestions made by Mr. Brunel with respect to the introduction in the Ordnance maps of the true meridian, as well as the true longitude and latitude, as it would appear advisable that these suggestions, if possible, should be carried into effect." The Ordnance Survey Department replied to that call upon them by the expression of a strong opinion in favour of the maintenance of the six-inch map, upon which the Treasury modified its view as follows, on the 16th of December 1851: "My Lords have before them the following recommendations with regard to the future conduct and publication of the survey of Scotland, contained in the Report of the Select Committee of the House of Commons of last Session on the Ordnance Survey (Scotland)." Then follow the recommendations: "My Lords also read the letter from the Secretary to the Ordnance, dated 28th ultimo, enclosing reports from the superintendent of the Ordnance survey and the Inspector-general of Fortifications, and other papers, and expressing the entire concurrence of the Master-general and Board in the views taken by those officers of the important subject of the proposed alterations in carrying forward the survey of Scotland. Their Lordships observe, that in the opinion of the superintendent of the survey it is highly desirable that at least the mineral, manufacturing, and improvable districts of Scotland should be surveyed on both the six and one-inch scales, and that the abandonment of the contouring should be confined to lands above the elevation at which the cultivation of the soil ceases. The Inspector-general of Fortifications considers that the information hitherto before this Board on the subject of the reduction of the scale is partial and imperfect, while the matter is one deserving of very full consideration." Then comes the decision: "My Lords understand that surveys of certain counties in England, as well as in Scotland, have been begun, and partly published, on the scale of six inches to the mile; and they consider that the survey of those counties should be completed on the same scale, and according to the same arrangements in other respects as are now in force; but that no expense should be incurred for the survey of other counties until this important subject shall have received more full consideration." It is to be observed that the Treasury did not pronounce any final opinion, but confined itself to the counties already commenced on the six-inch scale; that they should be completed on the six-inch scale pending the consideration of this important subject.

9. The *Lord Advocate.*] Does that decision of the Treasury extend to the question of contouring as well as to the question of scale?—At first there was a

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

general expression of a disposition to concur in all the recommendations of the Committee. In the second Minute there is a reference to the staggering opinions which we had received from the Ordnance, and a resolution to continue the operations actually in progress, including the contouring, as regards the counties which had been commenced, and to reserve the rest for further consideration, so that the partial completion was complete on all points, and the reservation was complete also.

10. *Chairman.*] In consequence of the Report of the Committee in 1851, was any Resolution come to by the House of Commons?—No, I believe not.

11. Was the question discussed in the House of Commons?—I do not recollect; there was no Act of Parliament; there was no Resolution of the House of Commons, but there was a Resolution of a Select Committee. I mentioned that on a previous occasion the Treasury deferred for many years to act on the recommendation of another Select Committee.

12. The *Lord Advocate.*] As regards contouring, the Committee having recommended that contouring should be abandoned, did the Treasury carry on contouring without intermission throughout the whole of the Irish survey?—I am afraid there has been a misunderstanding; there was another Select Committee on the Irish Survey in the year 1853, which recommended that the contouring should be completed over the whole of Ireland, and the contouring of Ireland was carried on in accordance with the recommendation of that Select Committee.

13. The question which I asked you was, whether as regarded contouring, the abandonment of contouring having been recommended, the Treasury continued contouring without any intermission, or not?—They continued it without intermission as regards the counties which had been commenced on that principle.

14. And with regard to Ireland?—Lord Elcho's Committee only had reference to Scotland; it did not refer to Ireland.

15. *Chairman.*] The recommendation of the Committee in 1851, was with reference to the contouring in Scotland, and had no reference to the contouring in Ireland?—No; but in 1853 a Select Committee on the Survey of Ireland recommended that the contouring should be completed over the whole of Ireland.

16. In fact, the Treasury merely completed the survey and the contouring that had been commenced in those counties that were actually being surveyed at the time that the Scotch Committee in 1851 met?—It confined its resolution at that time to completing the survey, as it was in progress, in the counties which had been commenced, leaving all other counties for further consideration.

17. That was with reference to Scotland?—Yes. The Ordnance then reported the manner in which they proposed to carry into effect this decision of the Treasury, which was as follows: They proposed to complete Lancashire and Yorkshire on the six-inch scale, contouring as before according to the existing plan. In Scotland, Wigtonshire had been completed, contoured, and published. Kirkcudbrightshire being nearly completed, it was recommended that it should be finished in the same manner. Edinburghshire being also surveyed on the six-inch scale, and the engraving commenced, it was recommended that it should be similarly completed; and that the rest of Scotland should be done on the one-inch scale, not contoured, but hill-sketched; and the Treasury approved of these arrangements.

18. Mr. *Ellice.*] That was proposed by the Ordnance?—That was proposed by the Ordnance, and the Treasury approved of it. It was not the course of which the Ordnance themselves approved, but it was in fulfilment of the orders of the Treasury. Then commenced a strong reaction in Scotland, and the Treasury began to receive representations from Commissioners of Supply, Royal Burghs, and various public bodies and individuals in great numbers. I have made a collection of them, and I would suggest that in order to give an adequate idea of their importance as representing the general feeling of Scotland, a list of them should be given in, and I would put at the conclusion of them a letter recently received from Sir Roderick Murchison. It is dated the 26th of February 1856; he says, "In the prosecution of the geological survey of Scotland, the surveyors under my direction, having completed their observations in Haddingtonshire, are stopped in their endeavours to extend the same to Berwickshire, inasmuch as the six-inch survey on which they have been working is not carried into the latter county, *i. e.*, into the cultivated districts of it, which have been surveyed

surveyed on the 25-inch scale only. I have therefore to request that the Lords of the Treasury will give directions to the effect that the cultivated districts of the south of Scotland which have been lithographed, or are in the course of being lithographed, should be reduced from the 25-inch scale to the uniform scale of six inches to the mile." The answer was, "That the subject of the Ordnance survey is proposed to be referred to a Select Committee of the House of Commons; and my Lords are not prepared to give any further directions respecting the mode in which the results of the survey are to be recorded until the proceedings in Parliament shall have terminated."

Sir *C. Trevelyan*, K.C.B.

8 April 1856

19. You speak of a certain number of representations having been made to the Treasury, to review their decision as to the six-inch scale; I suppose you are aware that although we have printed in this Report 32 letters in favour of the six-inch scale, there are also printed 120 letters or representations to the Treasury from the commissioners of supply, and people of great importance in Scotland, directly against the six-inch and in favour of the other scale?—In favour of the larger scale.

20. I suppose that is the fact, as it appears so here?—The subject had been much discussed in the meantime, and a more mature knowledge of it had been obtained.

21. I presume this is after the date to which you refer, because the whole of the letters you are now putting in must have referred to a period between December 1851 and the date of the Minute of the Treasury in answer to those, which could not have been until some months later?—The great majority of these applications commenced in May 1852, and went on until the end of 1853.

22. When was the Minute of the Treasury made which, in accordance with the wishes expressed in these communications, reviewed the former Minute?—The Minute of the Treasury, directing that the six-inch scale should be completed in the counties which had been commenced on that scale, was dated in December 1851; the representations began to come in early in 1852, and went through all the year 1852 to the end of 1853, the object of the representations being to induce the Treasury to reverse its decision against the six-inch scale.

23. What I want to ask you is, when the first Minute of the Treasury was passed, reversing in any way their Minute of the 1st of December 1851?—I am coming to that.

24. I would ask you whether this Report which we have here does not embrace the whole of that period?—Yes.

25. In June 1852, the representations in favour of the six-inch scale which had been received up to that time were referred to the Board of Ordnance for their opinion, to which only a general answer was returned, and the reply of the Treasury was as follows: "That although the final decision must be come to on the responsibility of this Board, it is necessary that my Lords should be assisted by the Executive department in forming their judgment as to the course which it will be proper to adopt, and they therefore request that the Master-general and Board will favour them with their opinion on the subject."

26. Was there no previous Minute to that passed by the Treasury, authorising the survey upon the six-inch scale in any particular county in Scotland?—No, there was none previously; there were several subsequently, and I am coming to them. The Ordnance reported on the 13th of the same month, with a special reference to the county of Fife. This is a letter from Colonel Hall, the superintendent of the Ordnance survey. He says, "The arable character of that county, its highly mineral nature, its numerous towns, its geographical situation involving a large extent of coast, the six-inch survey of which will save the hydrographical department of the Admiralty half their labour, all glaringly prove the justice of the claims of the Fifeshire people to a six-inch survey; and the present is a convenient moment for progressing with the six-inch survey of that county, as by so doing time will be given for further expression of public opinion regarding the scale upon which other parts of Scotland should be done." The Treasury Minute upon these papers is: "My Lords having had before them the whole of the recent correspondence on the subject of the scale of Ordnance survey, including the numerous memorials which have been received praying that the county of Fife may be surveyed on the six-inch scale, are pleased to determine that the survey of Fife should at once proceed on the six-inch scale, and that all other points should be reserved for further consideration hereafter."

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

The Treasury therefore modified its former decision, to the extent of allowing the six-inch survey to be extended to Fife, but still reserved the question for further consideration as regarded the rest of the country.

27. Mr. *Ellice.*] Did that involve contouring?—It involved the entire system on which the Ordnance survey was then being carried on; we did not deal with the subject piecemeal; we took the system as it then stood, and decided in the first instance that the survey should be completed according to that system in the counties which had been commenced upon it. The next case related to the county of Haddington; it was a representation of the landed proprietors and others of that county. The memorial states, "That your memorialists have been informed that instructions have been given to the officers of the Ordnance survey of Scotland to discontinue the survey of the county of Haddington according to the scale of six inches to the mile, and to adopt the one-inch scale. That your memorialists earnestly solicit your Lordships to reconsider these instructions, more particularly as they understand a large proportion of the said county has already been surveyed and mapped according to the six-inch scale. Your memorialists observe by your Lordships' Minute, of date 16th December 1851, that 'Surveys of certain counties in England, as well as in Scotland, have been begun, and partly published, on the scale of six inches to the mile,' and that your Lordships consider that the survey of those counties should be completed on the same scale and according to the same arrangements in other respects as are now in force. Your memorialists therefore trust, that as a large portion of the county has already been surveyed and planned according to the larger scale, your Lordships will direct the survey of East Lothian to be finished and published in accordance with the original design, upon the scale of six inches to the mile, so as to place the said county in the same category with the counties of Wigton and Kirkcudbright, and Edinburgh, which your memorialists are informed are to be published on the larger scale." The Minute upon that is, "Transmit a copy of this memorial, and of the accompanying letter from Colonel Charteris, to the Secretary to the Ordnance, and request that he will state to the Master-general and Board that it was the intention of this Board, as stated in their Lordships' Minute of 16th December last, that those counties which had been commenced upon the six-inch scale should be completed according to the same scale; and unless some good reason exists for making Haddingtonshire an exception from this rule, my Lords desire that the course of proceeding prescribed may be carried out in respect to that county." The next case related to the county of Durham. We received various representations from that county, praying that the survey of the county might be conducted according to the six-inch scale; those representations were referred to the Ordnance, and we received in reply a letter, dated the 27th September 1852, with an enclosure from the superintendent of the survey which contains this passage: "The enormous mineral wealth of Durham, its coal pits, and the numerous railways intersecting its breadth and length, are features which, in the opinion of all who have given evidence on the subject of maps, deserve a survey on a large scale; and I most strongly advocate that the petition from Durham be favourably considered, as, in my opinion, any scale less than the six-inch would be quite inadequate to the requirements of such a wealthy county; and I further beg the favour of a speedy decision on this point, as I am now perfectly ready to commence operations in the county of Durham, the survey of Yorkshire having reached the borders of the former county." There were several representations from Durham. In this bundle of representations which I have here there will be found several from Durham; here is one upon which the Minute is made: "The respectful memorial of the undersigned landowners in Stockton Ward, in the county of Durham. Your memorialists regret to find that the advantage of a survey and engraved map on the scale of six inches to a mile, which has been given to the counties of York and Lancaster, is to be withheld from the county of Durham, in which the survey is to be made on the scale of one inch to the mile. This county has a map on that scale already, which is a good guide map, and as useful as any map on that scale can be. The county is very rich in coal, iron ore, lead, and limestone, whose boundaries and position, with the outcrops of strata, and the dykes which intersect the coal field cannot be defined with accuracy, nor laid down for any practical purposes on a map engraved on the one-inch scale. For these purposes the six-inch scale, with levels and altitudes, is most important, especially in the west of the county, great part of which is unenclosed, with

with valuable veins of lead running through it, where a map on the larger scale would, by defining the boundaries and showing the relative position of all objects, tend to remove doubts, which lead to litigation and retard improvement." The Minute on this paper was, "My Lords, having reference to the peculiar circumstances of Durham county, its great mineral wealth, its numerous coal pits, and the railways intersecting its length and breadth, are of opinion that a survey on a large scale will be desirable for that county. They have therefore much satisfaction in complying with the request of the magistrates of the county, as conveyed in their memorial, as also with that of the landowners in Stockton Ward; and my Lords are pleased accordingly to sanction the adoption of the six-inch scale for the Ordnance survey of Durham county."

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

28. Mr. *Ellice.*] That was with a view to geological purposes, I suppose?—Principally mining: draining operations connected with mines render it specially important to have a correct survey.

29. That is very much opposed to the opinion of the Geological Society, is it not?—I have shown what Sir Roderick Murchison thinks*, and he, I believe, is a great authority, and what Sir Henry Delabeche practically found, that the inch survey was not sufficient. The next case relates to the counties of Dumfries and Ayr. On the 25th of February the Master-general and Board forwarded a report from the superintendent of the Ordnance survey, requesting early instructions as to the scale on which these counties should be surveyed; and they added, "I am at the same time to request you will submit to their Lordships the Master-general's and Board's most earnest recommendation that the six-inch scale may be carried out in the counties of Ayr and Dumfries." The enclosure states, that "the time has now arrived when it is absolutely necessary that I should receive immediate instructions as to the scale on which the surveys of the counties of Dumfries and Ayr are to be executed, as parties of surveyors are rapidly becoming available for new work, and until I am favoured with a decision to enable me to proceed with some counties in the south-west of Scotland, I shall be unable to allocate a new district to the surveyors' force which is now completing other parts." On the 13th of April 1853 we received a further representation from the Ordnance, with a further report from Colonel Hall, calling attention to their previous report; and I will read the enclosure from Colonel Hall: "I beg to call your attention to my letter of the 19th February last, in which I represented the necessity for early orders to proceed with some of the counties in the south-west of Scotland. Petitions having been sent for the survey of Dumfriesshire and Ayrshire on the six-inch scale, and these counties being in a degree advanced for that scale, I considered that they should be next taken upon the six-inch scale. Two months have elapsed since my letter of the 19th February, and I have now the honour to report that officers and men are at the present moment awaiting the allocation of new districts, and that a continuance of delay in receiving orders will cause considerable loss to the public service both of time and money." Upon these two communications, the Treasury passed the following Minute, dated the 15th April 1853: "Write to the Secretary to the Ordnance, that, pending the final decision as to the scale upon which the Ordnance survey shall for the future be carried on, it appears to my Lords that the fieldwork of the surveys of Ayrshire and Dumfriesshire should be carried on with that degree of accuracy which would admit of the plans of the cultivated districts being hereafter drawn to the scale of 24 inches to a mile, if desired; and my Lords authorise the adoption of this course, provided the Master-general and Board are not aware of any valid objection thereto." All the previous decisions, subsequently to the Report of Lord Elcho's Committee, had reference to special cases, and this was the first of a general nature. I will read it again, as it is very important: "Write to the Secretary to the Ordnance, that pending the final decision as to the scale upon which the Ordnance survey shall for the future be carried on, it appears to my Lords that the fieldwork" (only the actual survey, not the engraving; and I may mention that 860,000 acres accumulated unengraved, in consequence of the delay of the decision causing great inconvenience and loss of power),—"it appears to my Lords that the fieldwork of the surveys of Ayrshire and Dumfriesshire should be carried on with that degree of accuracy which would admit of the plans of the cultivated districts being here after drawn to the scale of 24 inches to a mile, if desired; and my Lords authorise the adoption of this course, provided the Master-general and Board are not aware of any valid objection thereto." In fact, we desired, till a final decision was come to, that the survey should be carried on on

See Q. 18.

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

a scale sufficiently large, either for the six-inch or for the still larger scale which had been pressed upon the Treasury in the meantime from other quarters.

30. The *Lord Advocate.*] I thought that everything that had been pressed upon you had been for the six-inch scale?—But the attention of the country, and of professional and scientific people who devote their attention to such subjects, having been strongly called to the subject by this discussion, an opinion arose, and was continually growing, that the six-inch scale was not sufficiently large, but that a still larger scale was required to obtain the objects aimed at; so that at this time it became necessary for the Treasury to include in its course of proceeding a reference to a still larger scale than a six-inch scale; therefore it desired that the further progress of the field survey should be on a scale which could be laid down to any scale whatever.

31. Was that done at the suggestion of the Treasury, or was it done at the request of proprietors in Scotland?—It was the consequence of a consideration of the subject at the Treasury, which is described in one of the series of papers contained in the Blue Book. I will give the pages: from page 19 to 52, commencing with Lord Elcho's memorandum. The date of the Minute relating to the field survey of Ayrshire and Dumfriesshire was the 15th of April 1853, and on the 16th of April the following circular was issued to all those persons in every part of the United Kingdom who were understood to have most turned their attention to the subject, and were most likely to assist the Government with sound advice.

32. To what page do you refer?—Fifty-three; and, with the permission of the Committee, I will read the circular. "The accompanying correspondence and memoranda describe, first, the grounds upon which it was determined, in 1840, to publish the Ordnance map on the scale of six inches to the mile for the country, and five feet to the mile for towns; and, secondly, the opinions now given on the question, whether the purposes which a national survey ought to subserve would be more fully provided for by an increased scale; and how far such increased scale would involve increased expense. The Lords Commissioners of Her Majesty's Treasury request that, after having attentively read these papers, you will state, in the annexed form, what scales you would recommend for any national surveys which may henceforward be carried on at the public expense; and that you will add any special observations you may have to make in support of your opinions. It is assumed that the results of the Ordnance survey will, under any circumstances, be separately published on the reduced scale of one inch to the mile; and the question upon which an opinion is solicited is merely between the scale of six inches and any larger scale." I should mention that the doubt which the Treasury entertained at this time, whether the six-inch scale was sufficiently large to include the objects, the inclusion of which was the avowed principle of it, was not merely founded on theoretical opinions, but upon the practical experience of the department of the Government which has to do with this subject. The Enclosure, Copyhold, and Tithe Commissioners have to do on a very large scale with operations for the proper conducting of which maps of this kind are specially necessary; for instance, the enfranchisement of copyholds, the re-apportionment of tithes, exchanges of land, drainage operations, and so on, on a large scale. Colonel James enumerates the objects which a national survey should subserve, as follows: "First, the registration of titles to simplify and cheapen the conveyance of land, to be attached to deeds of sale and leases. Secondly, local valuations and assessments. Thirdly, adjustment of the civil and ecclesiastical divisions. Fourthly, enclosure of waste lands. Fifthly, sanitary purposes. Sixthly, statistics. Seventhly, Parliamentary, in reference to Standing Orders. Eighthly, geological, mineral, and hydrographical surveys. Ninthly, general drainage and engineering purposes. Tenthly, military and purely scientific purposes." And to these may now be added agricultural statistics, for collecting which a large-scale map furnishes an excellent framework. In the operations of the Inclosure and Copyhold Commission we had the most conclusive experimental proof that the large-scale maps were necessary for a great variety of agricultural and civil engineering, sanitary, mining, and assessment operations; and the test of a map being sufficiently large for all these purposes is always stated to be that the quantity of land occupied by a cottage or a small field can be measured from the map, and compared with the number in the reference book, so as to test the correctness of both. We received a great number of answers from the

persons

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

persons who had been represented to the Treasury as being the highest authorities on the subject, and as having the greatest right to give an opinion upon it. I will call the attention of the Committee particularly to the answer of the Copyhold, Enclosure, and Tithe Commissioners; they are indicated by numbers; that is No. 7; it is at page 79; and the Commissioners give comparative specimens of the maps, with a view to show that the six-inch map is not sufficiently large to give the proper dimensions of small allotments, and that it is necessary to have a larger scale. The answer from the Society for promoting the Amendment of the Law, No. 44, at page 102, is very important. I beg to be permitted to read it. "The Society for promoting the Amendment of the Law having appointed a committee in the year 1846, to consider the propriety of making a general map of the lands of England and Wales, for the purpose of registration and conveyance, and otherwise, and to ascertain what steps have been taken, and what materials are forthcoming for making such a map, adopted the report of that committee, which recommended the scale of 13 ⅓ inches to a mile for rural districts, and 80 inches to a mile for towns. The council of the society adhere to that opinion as regards the scale for publication of the plans of rural districts, but, taking more fully into consideration the importance of minute accuracy for the purpose of registration of lands, the society recommend for the draft plans of rural districts and towns respectively the adoption of the larger scales abovementioned." The opinion of the Lord Advocate at page 139, and of the Board of Supervision for the Relief of the Poor, at pages 131–2, are also very important. I will read an extract from the latter: "The poor rates, prison rates, and various other local rates in Scotland, are assessed on the annual value of lands and heritages; but the same property is generally assessed on different values for the different rates, and properties in different parts of the country are valued on totally different principles for the same rate. If at any time it should be deemed necessary or expedient to have a general revaluation on one uniform system for all local rates, the value of a record map, on a sufficient scale to give the limits of every separate tenement, would for that purpose be inestimable. On the other hand, it appears to the Board that for all purposes of local taxation affecting land, for the valuation, registration, or transfer of landed property, for all purposes connected with agricultural statistics, and many other matters of national importance, the survey must be comparatively of little value, unless it puts the country in possession of a map for record, on which the precise limits of every separate tenement can be pointed out and measured." There are many other very valuable and important opinions, to which I do not consider it necessary to allude here; but the general result was, that there were in favour of the six-inch scale 32 opinions, and in favour of the larger scales 120. That will be found in pages 53 to 56. In making this reference the Treasury considered that the subject was so important, and that it was so doubtful whether even the six-inch scale would answer the objects intended, that it was necessary to refer to a jury of the whole country, consisting of the persons most competent for this purpose; and the result proved to be very decidedly in favour of a large scale. The question then occurred, what large scale? because several had been recommended; and upon that another circular, dated the 16th January 1854, was sent to the same persons to whom the previous reference had been made; and I will read that, with the permission of the Committee, from page 225: "I am commanded by the Lords Commissioners of Her Majesty's Treasury to convey to you their thanks for your answer to their previous communication on the subject of the Ordnance survey, and to request that you will, at your earliest convenience, inform them which of the undermentioned scales you would recommend, supposing it to be determined that the scale shall be sufficiently large to comprehend all the objects for which surveys and plans are usually made." [This has reference to the detailed application of the principle of the large scale]: first, a scale of 24 inches to the mile for rural, and of 10 feet to the mile for town districts; secondly, a scale of three chains to the inch, or 26 ⅔ inches to the mile for rural, and of 10 feet for town districts; or, thirdly, scales bearing a definite numerical proportion to the linear measurement of the ground to be mapped, *id est*, the scale of one two-thousand-five-hundredth for rural districts, and one five-hundredth for towns, as recommended by the Statistical Society of London and the Statistical Conference at Brussels, those being the fractions now in general use on the continent of Europe, and nearly equivalent to the scales of 2 feet 1 ⅓ inches to the mile for rural districts, and 10 feet 6 ⅔ inches to the mile for towns. My Lords request that you will

Sir C. *Trevelyan*, K.C.B.

8 April 1856.

will further state your opinion whether the adoption of these decimal scales would be productive of any practical inconvenience." Upon receiving the reply to these circulars, the Treasury assembled a committee, consisting of Sir John Burgoyne, Inspector-general of Fortifications, Mr. Blamire, Commissioner of Enclosure and Tithes, and Mr. Rendel, the civil engineer, with directions to consider the evidence which the replies to the circular contained, and report what, in their opinion, was the conclusion to be derived from it in reference to the question between these several detailed scales and the general result; and the decision of the Treasury upon it is contained in the Minute dated 15th July 1854, at page 344; and I will read the four last paragraphs, with the permission of the Committee: "This Committee has reported unanimously their opinion that the weight of evidence contained in the printed correspondence submitted to them is decidedly in favour of the scale of one two-thousand-five-hundredth of the linear measure of the ground to be mapped. Under these circumstances, my Lords are of opinion that the surveys of Ayrshire and Dumfriesshire should be laid down and drawn on paper to the scale recommended by the Committee, *i. e.* one two thousand-five-hundredth of the linear measurement of the ground; and that upon the margin of every separate sheet of the map, in addition to the statement of the proportion which the linear measurement of the map bears to reality, there should be drawn scales expressing English feet, yards, chains, and miles, so as to provide for a ready comparison with other maps. My Lords are also of opinion that until a final determination shall be arrived at as to the scale upon which the Ordnance survey shall be conducted and engraved, the course which has been authorised in reference to Ayrshire and Dumfriesshire should be applied to the survey of other districts. Previously, however, to sanctioning the adoption of the large scale as a general measure, my Lords deem it right to ascertain, by actual experiment, the increased cost of such surveys and maps in comparison with those drawn to the scale of six inches to a mile; and they therefore desire that in the further progress of the survey of rural districts, trial be made of the system of piecework within the department, and of that of independent contracts with other surveyors, supervised and approved by the officers of the survey; and that an accurate account be kept, under separate heads, of the cost of the work according to each of these processes, as well as according to that of daily pay, hitherto in practice; and that a report be made to this Board, at the earliest practicable date, of the expense of the survey on the large scale, according to each of the above processes, as compared with that of the six-inch scale" Then a question arose as to contouring, and another committee was appointed, consisting of the noblemen and gentlemen mentioned at page 364, with directions to report, first, "Whether the advantages to the public to be derived from the exhibition of contour lines on the Ordnance maps are commensurate with the cost of their production; and, secondly, whether the advantages which are derivable from this system may or may not be attained, to a sufficient extent and at a considerably less cost, by the adoption of any other process;" and their recommendations, which were to the effect that a modified system of contours should be carried on, will be found at page 366; but they also made a recommendation, which was not contained in the reference made to them, which is their sixth recommendation, "that in those districts to which the large scale of 24 or 26 inches to the mile is already applied, it would be most desirable that a reduction should be made and published on the six-inch or some intermediate scale between the large plans and the one-inch map." As there was some doubt as to the meaning of the recommendation of the committee, a reference was made to Sir John Burgoyne, who acted as chairman, and his answer will be found at page 368: "I think I can with great confidence state, that the recommendation had in view hill-sketching on the ground, and hill-drawing on artistic principles, to which they proposed should be added selected contours from those that might be authorised for the larger surveys."

33. Mr. *Ellice.*] Those recommendations were distinctly against what is called the contouring system, as carried out to the extent it was originally intended, and as it is carried out in some of the maps, were they not?—They were against an entire reliance upon the contouring system; they proposed to connect it with a system of hill-sketching.

34. It abandoned about four-fifths of the old contouring system, did it not?—I am unable to say; the exact proportion is left undefined, but it retained the principle of describing elevations by contours, but to a limited extent, according to the nature of the country. At page 345, immediately after the Minute, there are

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

are letters upon contouring and hill-sketching from Major Larcom, from Colonel Dawson, from Mr. Vignoles, and a paper by Mr. Robert Dawson, late of the corps of Royal Military Surveyors and Draftsmen, the father of Colonel Dawson, and the gentleman who executed the beautiful hill-sketched maps of Wales, which have been considered ever since to be perfect models. The next important step was a Treasury Minute, dated 18th May 1855, which, with the permission of the Committee, I will read: "My Lords have before them their Minute, dated 15th July 1854, on the subject of the Ordnance survey, in which it was stated that the committee composed of Sir John Burgoyne, Mr. Blamire, and Mr. Rendel, had unanimously reported their opinion that the weight of evidence contained in the numerous replies to the circular letter from the Treasury, dated 16th January 1854, was decidedly in favour of the scale of one two-thousand-five hundredths of the linear measure of the ground to be mapped; and that under these circumstances the surveys of Ayrshire and Dumfriesshire should be laid down, and drawn on paper to the scale recommended by the committee, and that until a final determination should be arrived at as to the scale upon which the Ordnance survey should be conducted and engraved, the course which had been authorised in reference to Ayrshire and Dumfriesshire should be applied to the survey of other districts." I should mention that it became absolutely necessary at this time to adopt a scale upon which the map was to be engraved, because an accumulation of between 800,000 and 900,000 acres unengraved, had taken place, and a large body of draftsmen and engravers were kept idle, who could not be kept employed from want of a definite decision, and who could not be dismissed because we might require their services. "After a careful consideration of the subject, my Lords have arrived at the following conclusions: 1. That it is unnecessary to have plans of the Highlands and extensive moorland tracts, as well as other uncultivated districts, made on the scale of one two-thousand-five-hundredths; that the said scale should be limited to the populous, mineral, and cultivated districts; and that the superintendent of the survey, acting according to these general rules, should exercise his discretion as to the districts, the plans of which are to be made on this scale. 2. That plans on the one two-thousand-five-hundredths scale should not be engraved, but that copies, when wanted, should be made by the anastatic process, with reference books in which the area of each enclosure would be given. 3. That the Highland and other partially cultivated and thinly peopled districts should be drawn on the scale of six inches to the mile; and copies, when wanted, should be made by the anastatic process. 4. That the general map of Scotland, on the scale of one inch to the mile, should be proceeded with as rapidly as possible. 5. That the plans of towns containing more than 4,000 inhabitants, which have hitherto been drawn on the scale of five feet to a mile, should be drawn on the scale of one five-hundredths of the linear measurement, which is equivalent to 126·72 inches to a mile. 6. That local contributions in aid of the expense of the survey should not be required, except in the case of special surveys made in districts in which the general survey is not in progress."

35. Did you not also suggest that the larger plan should be limited to certain elevations, and that all grounds above that altitude should have a smaller scale?—No, I do not recollect that; that was not a recommendation made by the Treasury.

36. But was it a recommendation to the Treasury?—We received many recommendations, but the Treasury never entertained any such idea as that. The only remaining important documents are a letter from the War Department, forwarding the report of Colonel James, on the reference which had been made to him in regard to the comparative expense of these different scales of survey after a new plan of proceeding by piecework within the department and contract out of the department had been applied to them. That is dated the 27th February 1856; the result is stated in Colonel James's report, dated the 4th of February 1856, and it is shortly this: According to the old plan of daily pay, the expense of the large scale per acre is 1 *s.* 1 *d.*, according to piecework within the department 1 *s.*, which he hopes to reduce to 11 *d.*, and the expense of the six-inch scale is 9¼ *d.* The result of piece or task-work within the department was exceedingly favourable, but not so the contract work; and I may mention that in the course of our experience two other practical proofs have appeared that contract work by independent surveyors cannot generally be relied upon as a sufficiently accurate basis for a detailed national survey. One of these instances is contained in the Blue Book at page 3, where

Vide Appendix.

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

where Colonel Colby, speaking of his early operations connected with English survey, says he applied for the aid of more officers of Royal Engineers, and employed them in examining the old plans which had been made by contract, with a view to their inserting upon those plans the alterations which had subsequently taken place in the country; he says, "To my great regret, I found that the contract plans had in very few instances possessed the original accuracy which would have fitted them to have formed the kind of map which was required by the country." The other instance is the operations of the Tithe Commission, under whose directions two millions of money were laid out in plans of this description, and although sufficient for their purpose, they are quite insufficient to form the basis of an accurate survey.

37. Mr. *L. Davies.*] They are utterly insufficient, are they not, for a common appeal before the magistrates?—Yes, whereas Colonel Colby reported that less than that two millions would have been sufficient to have given the whole of England the advantage of a detailed national survey. The other letter of the Secretary of State for War is dated 1st of August 1855, enclosing a report from Colonel James, dated the 30th of June 1855, stating his reasons for engraving the result of the survey on a six-inch scale as well as on a one-inch scale; so that the official footing on which the matter stands according to the decision of the Treasury, is that the country shall be surveyed on the large scale, that is, that the low land and cultivated districts shall be surveyed on the large scale; that it shall be laid down and drawn on paper on the large scale, but that it shall be engraved and published only on the inch scale; and supposing the Committee to affirm all that has been done up to the present time, the main question for your consideration will be, whether besides drawing the results of the survey on the large scale, and publishing them on the inch scale, they should also be engraved and published on a six-inch scale or on any intermediate scale.

Appendix.

38. *Chairman.*] You have given your attention to the subject of Ordnance surveys for years; be kind enough to state to the Committee your opinion upon the subject?—I certainly may, without presumption, give a confident opinion, because for many years I have been well acquainted with everything that has taken place in relation to this matter. The Treasury has been the centre of operations on this subject. I have read every paper relating to it; and I have times innumerable conferred with various officers, beginning with Colonel Colby, and Sir John Burgoyne, and other officers—and gentlemen who are considered the highest authorities on this subject. My first connexion with it was when I first received my appointment at the Treasury. Sir Francis Baring, the then Chancellor of the Exchequer, called my attention to a large number of documents which had accumulated at the Treasury on the subject, and which had not been disposed of. Then followed the reference to the Duke of Wellington, and the Treasury Minute of the 1st of October 1840 which is in my handwriting. The result of my consideration of the subject is this: I am clearly of opinion that a survey on a large scale is very important for economical and social purposes of more kinds than can be described; and I believe that if, as I have no doubt will be the case, the country shall be resurveyed, beginning from the Land's End, on the large scale, it will be money very profitably laid out. It will be money which will be extremely productive in more ways than can be described. Just as railroads, even when they do not yield a profit to the proprietors, facilitate in a variety of ways the business of the country, so will this survey facilitate the business of the country in more ways than can readily be detailed, including the assessment, registration, and transfer of property, and various other matters. I am clearly of opinion that the country ought to be surveyed on the large scale; that it should be laid down and drawn on that scale, and that copies on that large scale should be multiplied by the cheap lithographic and anastatic processes, which have been much improved of late years; for while this great question has been in progress, various improvements have been made both in the mode of making surveys and publishing them; but those will be more fully explained by the superintendent, Colonel James. I also think that the particular application of the large scale which has been resolved on, the decimal scale showing one two-thousand-five-hundredths part of the actual surface of the ground, is the most convenient; but I would not engrave this scale; I would deposit copies of it in central situations where it would be generally accessible, especially at the head-quarters of the survey, and I would facilitate the multiplying of copies by these cheap processes; and if the persons particularly interested in any district should desire to have it engraved, I think it should be done at their expense.

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

expense. Or it may be done in this way: if proof is afforded that it would be a profitable transaction to engrave any particular sheets of the survey, they might be engraved for the survey, but I would not engrave them as a general rule. These mechanical processes, which have been so much improved of late years, have a very important bearing on the progress of this subject. Next, reserving this large scale, drawn, generally speaking, on paper, and containing a full picture and record of the face of the country and all the prominent objects upon it, I would condense the information contained in it into the six-inch scale. I consider that to be necessary, in order to make the results of the large-scale survey practically and conveniently available. I may also observe, that as estates extend over various districts and various descriptions of ground, cultivated and uncultivated, unless we have one general scale sufficiently large for estate, and civil engineering, and other social purposes, many important objects of the survey will be lost; therefore, I would have one uniform six-inch map of the whole country, which may be described as a popular version of the large-scale map. And it must be observed, that these different scales are necessarily connected; the six-inch map will act as an index to the large-scale map, just as the one-inch map will act as an index to the six-inch map. If we were to put all the objects which have to be described into the smaller maps, the contents of the mining and manufacturing districts of this wealthy country are so numerous, so crowded, and so closely packed, that there would be great difficulty in getting them even into a six-inch map; still less can they be got into a one-inch map. So one step of the scale relieves another. By having a large scale of the whole to refer to for details, you are able to relieve the six-inch map and to make it popularly useful. In the same way, having a six-inch map containing all the more important objects, you can deal very freely with the one-inch map, and apply it in the most direct manner to geographical and popular purposes.

39. Is one of your principal objects in proposing the large scale that it can be readily and economically reduced to any other scale?—Yes; if you take any scale short of the largest, you lose all the advantages to be obtained outside your scale; but if you take the largest, you can always reduce it to any of the smaller scales at pleasure. Then there is this important general consideration,—that the great expense of a survey is the actual surveying; I mean the expense of a head-quarter establishment for superintendence, the expense of skilled scientific surveyors, and of chainmen, and the numerous persons employed in the actual survey. When you determine to make a survey of the country, you determine on a very expensive thing, but the additional expense of including all the objects which can be included in a survey is comparatively slight; the difference between the field survey which is necessary for an inch map and that which is necessary for a six-inch map is comparatively slight, although I cannot state what the difference is.

40. Do you mean that the difference between the actual expense of surveying on the largest scale and surveying for the six-inch plan is very immaterial?—Between the six-inch and the large scale it is very slight. I have given an instance of that. We might have had a full detailed survey of the six northern counties; Northumberland, Cumberland, Westmoreland, Durham, Lancashire, and Yorkshire, with all their great manufacturing and mining interests, on this large scale, for an additional expense of only 2*d.* an acre, or 68,500*l.*; and we flinched from obtaining that great advantage, fearing that the rest of the country, seeing what a great advantage it was, might demand participation in it. My opinion is, that the advantage is so great and so manifest, that the whole country ought to have it, and that the survey should be completed with all possible speed to John-o'-Groat's House, and the Orkneys and Shetlands, and then go back to the Land's End.

41. Mr. *L. Davies.*] Have you directed your attention to the comparative benefit to be derived from the large scale by parties interested in personal property, and parties possessed of real estate, because it is said that the object of this, and its effect, will be to benefit the landowners?—I consider that the uses of the survey are so extensive and various, that you cannot with propriety pick out any particular class of the community and say that they are more interested than any other. It has been a prevailing fallacy to fix it on some particular class, and to say that we are making a survey for the benefit of the landowners for instance. There is no doubt that the landowners will benefit by it, and so they ought, because they largely contribute to the taxation of the country, and are a very important class. The benefit to them will be, that every landowner will have a detailed, accurate,

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

and authentic survey of his estate as a basis for all improvements in drainage, irrigation, and enclosing, for rating, and above all, for the registration and transfer of property. Those who have given attention to such subjects agree in saying, that in order to make real property as transferable as personal property, it is a necessary preliminary to have an exact picture of the country, in the shape of an authentic survey. It is the first step towards the establishment of a good registration of landed property and the simplification of our complex, expensive, and onerous system of conveyancing; and although proprietors are primarily interested in this important object, yet all other classes of the community are in their degree extremely interested in it, including every person possessed of personal property, who either wishes to buy an estate, or to invest his money on mortgage, or who desires the general prosperity of the country, with which the interests of all classes of persons are bound up.

42. You are aware that in the case of the purchase of property, the purchaser very often has a survey of it made himself; would this plan supersede the necessity for that?—Entirely; the conveyance might be written on the back of the sheet containing the estate.

43. *Chairman.*] I understand you to say, that having formed a very decided opinion as to the vast advantage which would arise to the country from this large survey, you formed that opinion, not with any view to the peculiar advantage to accrue to any one portion or class of the public, but with reference to the public generally?—Yes, with reference to the whole public; and the best illustration of it, I think, is the operations of the Enclosure Commission. Even that does not include a twentieth part of the real advantage it would be of to the country, but still anybody who spends a few hours in the Enclosure Commission in St. James's-square, and sees the detailed and complex nature of their operations upon land, will be able to form some idea of the immense importance to all the interests of the country of this perfect picture and delineation and description of its surface, and of all things thereon.

44. I understand you to say that when the question of the 25-inch survey was first brought under notice of the Treasury, it was brought under their notice more with reference to the Tithe Commission, but without any reference whatever to the Ordnance survey of Scotland?—It was brought under the notice of the Treasury from these general considerations; the considerations I have now described were present to the mind of the Treasury, and the most practical illustration of them was the operations of a Government department which deals with the real property of the country on a very large scale, in immense detail, and with nearly the whole of that property; in the commutation of tithes, for instance, the whole of England was dealt with.

45. Mr. *L. Davies.*] You have spoken to the large outlay with reference to mapping for tithe purposes; are you aware that the second-class tithe maps have been found so insufficient that the Tithe Commissioners have required a new mapping to be made?—I am aware that the Tithe Commissioners and Colonel Dawson, from whom, and especially from the last-mentioned distinguished officer, the Treasury has, from first to last, received important advice and assistance on this subject, in the year 1837, highly to their honour, made a pressing representation to the Government that as the whole country must be surveyed in detail for tithe purpoes, at a great expense, it would be extremely desirable that it should be an authentic national survey, in order that it might be available, not only for the present purpose of the commutation of tithes, but for all other purposes for which detailed authentic maps are required, but their representations were overruled.

46. You are aware, are you not, that there was an option given to the proprietors whether they would select the first or second class maps, and that that option was destructive of the whole system?—Yes, the Commissioners desired that the survey of the whole country for tithe purposes should be conducted by national machinery, in order that it might be available for all purposes whatever, and thereby save a great amount in future years both to individuals who have to make constant resurveys of different districts, and to the country at large, represented by the Government, who they foresaw would sooner or later have to do the thing which they then recommended; but their advice was not taken, and the consequences have been that the same Commission having had its operations extended to other purposes connected with the land, such as superintending the applications of the drainage loans, the enfranchisement of copyholds, the exchange of land, the re-apportionments of tithes, and other purposes, when they came

came to use the maps which had been made at this great expense for tithe purposes, and to apply them to these other purposes, they found them in a great majority of instances quite untrustworthy; and the country has been put to great expense, and there has been a great waste of valuable time and labour in order to do over again piecemeal that which the Commissioners then recommended should be done once for all in the most authentic manner.

47. Has it ever come to your knowledge that in a particular locality the mapping has been paid for three times within a short period. First, there has been the mapping for the Tithe Commission appointment; and, secondly, the mapping for the Inclosure Commissioners; and then when a party has been about to sell his property, both surveys being found imperfect, he has been obliged to have it mapped and measured at his own expense again?—With regard to the first survey, for tithe purposes, that is obvious; as to the second survey, for inclosure purposes, nobody who closely examines the extremely detailed and minute nature of the maps and other proceedings necessary for apportioning inclosures according to the various interests concerned, can doubt that a map of the greatest possible detail and authenticity is necessary; and as we know that the majority of the tithe maps were imperfect, I can easily conceive that a new map had to be made for the inclosure; in fact, I know that it had to be made in numerous instances. The third case is less conceivable; a map had been made for the inclosure, and I do not understand why the same map would not suffice for estate purposes; at least, I cannot see why it should be imperfect as to accuracy; the map for the purpose of enclosure ought to have been perfectly accurate; but then even the enclosure maps are conducted, not by any responsible public establishment acting on fixed and uniform principles, but by individual surveyors, who have various capacities and qualifications; therefore there can be no certainty that the results of their labours will be authentic and accurate; whereas the organised machinery of the Ordnance survey has been been brought, under the able officers who have superintended it, to such a perfect state, that it may be entirely relied upon for an authentic, trustworthy, detailed map of the country, which will answer the purpose both of the apportionment of tithes, of inclosures, enfranchisements, drainage, irrigation, and sanitary improvements of towns, and will also effect the great object of simplifying and economising our system of registration and transfer of real property.

48. The *Lord Advocate.*] With regard to the Tithe Commissioners' survey, was it the scale that proved defective, or the execution of the work?—The execution of the work; the scale of three chains to an inch has been found sufficient for every purpose.

49. Mr. *L. Davies.*] But those plans were not executed under any responsible authority, were they?—They were tested and checked after they had been made, by the Tithe Commissioners, as far as was practicable.

50. But all they sought was to get the maps to dovetail; that was all they did, was it not; the exact measurment of the area was a consideration that rarely entered into their minds?—It was, no doubt, a sad waste of the national means.

51. *Chairman.*] If a 25-inch scale had been originally adopted, for the national survey, it would have been a wise and economical measure, in your judgment, would it not?—If it had been conducted and carried out by a Government establishment throughout the country, it would have been a very wise and economical measure; and it is so beneficial that, although so much money has been thrown away on insufficient scales, and imperfect applications of large scales, I would strongly recommend that an uniform national survey of the whole country on a large detailed plan should be completed, beginning with Scotland and then going back and beginning again at the Land's End.

52. Is it your opinion that it is a knowledge of the comparatively imperfect surveys which have been made under the tithe and inclosure system that has really given rise to the loud and general demand which exists for a new and enlarged survey?—That is one great cause of it; the country has now had experience of the subject, and the public opinion has been formed and matured, whereas decisions were come to on former occasions on imperfect data; I believe that there is now a prevailing public opinion in the right direction.

53. Mr. *Lockhart.*] The one-inch scale is only of use for travelling purposes; it is not sufficiently large for general practical purposes?—No.

54. With regard to the six-inch map, although that may be very desirable with reference to the townlands and property in Ireland, it does not answer the

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

purpose for Scotland?—No; there is no territorial division in Scotland answering to the townlands; it is a very small division, so that a comparatively small scale map is sufficient.

55. Therefore, although the six-inch map was a great advantage to Ireland, that is not so with reference to Scotland?—No, certainly not; that was soon discovered.

56. It was pointed out by Mr. Walker when he was writing about the Drogheda Railway that he found the six-inch map of very great advantage to him in making the survey for that railway; would it not have been a much greater advantage to him if he had had the 25-inch map, as we call it?—That is rather a professional question; but my impression, from the tenor of all the correspondence and papers on the subject, is, that for railway purposes, two classes of maps are necessary, first of all, a small scale map, that is, a comparatively small scale map, for the purpose of determining the general line of the railway and the levels, and so forth, and then, when the line has been determined upon, a map of the full size is required as the basis for the working drawings. Mr. Walker's meaning obviously was, that the six-inch map for that purpose was preferable to the one-inch map.

57. And therefore, *à fortiori*, this 24-inch map would be better, as the contour would have enabled him to make his levels easier?—No doubt both the six and the 25-inch map would have greatly aided the judgment of the country with regard to the lines of railway which have been formed of late years; it would have been of great service if those maps had been in existence; and the proof of it is, that in Ireland the lines of railways have been much better laid down; and those who have watched the progress of the subject must have observed that the choice of lines for the Irish railways has been distinctly evolved from the six-inch survey of the country.

58. In speaking of the 25-inch map, I understand you to say you are not disposed to have it engraved?—Not as a general rule.

59. But if engraved and published, is it not understood that it might be sold at a profit of something like 2*s.* a sheet?—There is evidence that particular portions of it might be sold; and where it is proved that particular sheets, if engraved, would be profitable, or would pay the expense of engraving, I would have them engraved.

60. It was said, that in the event of having a large 25-inch scale, local contributions might almost be expected or looked for; if those maps were published and sold at 2 *s.* profit, would not that amount to a sort of local contribution?—Yes, that is the best form of local contribution, and I adverted to it in a paper which I submitted to the Treasury in October 1854,* explaining the state of the question at that time; and the concluding passage of that paper on the subject of local contributions, showing how far the principle of local contribution may be introduced into the system of the Ordnance survey, contains all that I have to say upon the subject.

61. Are you aware that Sir William Paisley proposed, at one time, both a six, a 12, and a 24-inch scale?—Yes; that was advocated at one time by some of the officers of the Ordnance. In the progress of this question there has been a gradual growth of the public mind on the subject; and as the public mind grew in favour of the large scale, the Ordnance proceeded to the 12-inch scale as a medium scale; but that was very soon overborne.

62. I think I gathered from you that you prefer the 25-inch scale for social purposes?—Decidedly, but I must make an exception which I had forgot to mention. As a general rule, I decidedly prefer the 25-inch scale, as being the smallest scale that is sufficient to contain all those particulars which are necessary for facilitating the business of the country; but that observation applies only to the cultivated districts; there is a large district in the North, comprising from one-half to two-thirds of Scotland, the general character of which is that it is uncultivated; and I am of opinion that the six-inch scale, as regards that great district, will answer the same purposes of a detailed standard map as the 25-inch scale will answer for the south.

63. The *Lord Advocate.*] Would you survey these districts for the large scale, or

* Treasury Minute of 18th May 1855, and other Papers respecting the Ordnance Survey, presented by Command in 1855, page 6.

Sir C. Trevelyan, K.C.B.

8 April 1856.

or only for the six-inch scale?—The difference in the cost of surveying the Highland district for the six-inch scale and for the large scale, I believe, would be very slight. I would lay down this principle, that the field survey of the Highlands should include every object. That solves the question. Where you have a square mile without any object except red deer and sheep, it is a mere blank, and can be done in five minutes; if there are more objects, it will be worthy of greater attention and pains.

64. Mr. *Vernon.*] Have you given your attention to the scale on which you would wish the towns to be surveyed?—I am of opinion that the decision which was come to by the Treasury was the right one, that the towns should be surveyed on the scale of one five-hundredth part of the actual size. When the six-inch scale was resolved on for the six northern counties of England and for Scotland, it was determined that the towns should be surveyed on a scale of five feet to a mile. Then came the movement in favour of sanitary reform, and it soon became apparent that five feet was insufficient to describe the towns in the detailed manner, house by house and drain by drain, which the circumstances required; and it was pressed upon us first that a seven-feet scale was required, and at last we all settled down in the conviction that a 10-feet scale was necessary. There was a remarkable correspondence between the Treasury and the provost and town council of Glasgow; they pressed upon us a six-inch scale for the surrounding district, and a five-feet scale for the town; but we held our hands, because we said it had been ascertained by a large experience that a five-feet scale was not sufficient, and that they ought to have a 10-feet scale. We did this notwithstanding that the town council of Glasgow said they would be satisfied with a five-feet scale; but our conviction being that that was not large enough, and that for sanitary purposes a 10-feet scale was necessary, we, I may say, forced upon them a 10-feet scale, and indications have appeared, from representations from other bodies at Glasgow besides the town council, that the Treasury decision has been acquiesced in, and that the result of their experience at Glasgow is the same as it is elsewhere. For instance, Edinburgh and Liverpool were both surveyed on the five-feet scale, but that was found to be insufficient, and they had to be surveyed again on a 10-feet scale.

65. Mr. *Ellice.*] Was that found sufficient?—Yes, because as in the rural districts it is found that the 25-inch scale is the smallest which allows of areas being measured off the map (and that is the test), so in the towns it is found that the 10-feet scale is the smallest, because there you have to go to the smallest tenements; drains, cesspools, and so on.

66. *Chairman.*] If these towns had been originally surveyed on a larger scale, it could with facility have been reduced, could it not?—Of course; that is one of the advantages of a large scale over a small one, that you can always reduce the large scale; but you cannot enlarge a small one.

67. The *Lord Advocate.*] But the 25-inch scale is the smallest scale which admits of areas being measured from the map in the rural districts?—Yes.

68. Of course you think that too small for such measurement in the towns?—Yes; the 10-feet scale, which is represented by the one five-hundredth part of the actual area, is the smallest on which town areas can be properly represented.

69. Mr. *Lockhart.*] Have there been any representations made to the Treasury in favour of a 20-inch scale?—Yes, I think there were a few; 24 was a more favourite scale.

70. Have you any practical objection to that scale?—No; there is a great question of principle between the large scale and the small scale, but between the different applications of the large scale, from 20 up to 26⅔ inches, the difference is slight. The three-chain scale is the one in the application of which it has been proved by the experience of the country—and that a large experience—that a large scale is necessary. I think that a scale not much less than that is required.

71. Mr. *L. Davies.*] You have adverted slightly to the facility which one of the large maps would afford by avoiding the necessity for a description of the parcels in the deed of conveyance to the purchaser; do you wish the Committee to understand that there would be both facility and economy in the case of the transfer of property from such a map?—Very great.

72. And that large capitalists would have a facility afforded to them from such maps which does not now exist?—Yes; the map would save all that part of conveyancing which consists in the description of objects and boundaries.

73. Mr. *Denison.*] I presume that if it were found that at present the description

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

tion of boundaries which are contained in Scotch conveyances are very long and very expensive, such a map as you now describe would, to a great extent, supersede the necessity for that expense?—Indeed it would; it would save a great unproductive national expenditure.

74. Mr. *L. Davies.*] And much future litigation with regard to disputed boundaries?—Yes.

75. The *Lord Advocate.*] I understand that the 25-inch scale is about an inch to an acre?—Yes.

76. And, therefore, from an acre upwards one might sell any amount of land with the boundary completely and precisely marked upon the map?—Yes; and the map is most authentic, and that is a very important element in this consideration; it has been found by full experience that whatever deficiencies Government administration may have in other respects, it is quite equal to the delineation of a country in an accurate, authentic, and detailed manner.

77. Mr. *Davies.*] The land being distinctly and accurately defined on the map, a long description of it in the deed of conveyance would be unnecessary?—Yes; it is a perfectly authentic and detailed description of the country, and a perfectly secure record; the sheets of the map can be very easily multiplied, and are multiplied, so that if a particular sheet were lost, other sheets would be always available. Take, for instance, the most obscure country parish, the proprietors of land would have sheets of their property; the farmers would have them; they are exceedingly cheap, and would assist their operations in many ways; the clergymen, the schoolmasters, and doctors would have them, and many others.

78. And in a country where there is a system of registration of their conveyances, the having a map of this kind to accompany the deed, when registered, would be, in your opinion, a very great advantage?—Very great indeed. I speak mainly from the universal consent of those who have applied their minds to this most important subject of the simplification of conveyancing, and my own observation and reason entirely assent; it is impossible not to see that such will be the case. Great advantages have been obtained in India by the detailed survey of the Upper Provinces, which was made under the superintendence of the late Mr. Robert Bird, in connexion with the settlement of the land revenue; the lands of every village community were separately surveyed on a large scale in detail, showing the minute allotments of each village coparcener, and the map formed on that survey is constantly referred to in the transfer of land, and mortgages, and various transactions.

79. I apprehend you have some professional knowledge or experience with regard to deeds; would not the length of deeds be very greatly lessened by the facilities a map of this description would afford?—Yes; it would save all those parts of deeds which consist in a description of the matter transferred, its boundaries, and so forth; a line drawn on the map would suffice.

80. The *Lord Advocate.*] And whatever alteration might take place in enclosures and lines of road would not in any degree affect the accuracy of the records so kept?—Not in the least, because they can be multiplied *ad infinitum*, and it will not only save very lengthy descriptions, but it will save litigation and legal proceedings without end by the perfect identity which is secured.

81. Mr. *L. Davies.*] Will you go one step further; is it not the case that where parties survey their own property there can be no uniform principle, because two surveyors, equally intelligent and able, have no common ground to act on; whereas this being a map of a public character, equally affecting all, there would not be likely to be the same amount of litigation if there were a map of the description you propose to refer to, as would arise in the case of different maps or surveys made by individual proprietors, and therefore would it not be economical in that point of view?—Exceedingly so. At present two parties to a suit often have surveyors of their own, and a survey made by an individual private surveyor at one period is often questioned at a subsequent period.

82. And even on a trial, when the two surveyors come forward, they are very often antagonistic; whereas a map such as you propose would settle the question between both parties?—In producing a perfectly authentic, authoritative record, it produces a common record.

83. The *Lord Advocate.*] Are there any advantages, and if so, what are they, that the six-inch scale has over the 25-inch, except with regard to the expense?—The six-inch scale is more popularly useful; it is more generally available;

available; the large scale is cumbrous; it is recorded on large sheets of paper, and therefore the character of the large scale is that of a record for reference.

84. Mr. *L. Davies.*] If you will refer to page 334 of the evidence, you will see a reply of Sir John M'Neill's?—It is embarrassing to pronounce judgment between the two, because the merits of the two are different. My general impression is this: that if we were forced to choose between the two, it would be better to take the large scale, because that contains all we want; at some inconvenience, no doubt, but still there it is; we can always refer to it, and we can always, if we think proper, reduce it to the smaller scale; whereas, if we confine ourselves to the smaller scale we do not get all we want, and cannot enlarge it.

85. The *Lord Advocate.*] The advantages of the six-inch scale are, economy and convenience, if it were to be the only scale on which the survey were to take place?—Yes; but taken in connexion with the large scale, one of the advantages of it is, that it is an index to that scale; it enables you to put your hands at once upon the sheet of the large scale you want for further explanation.

86. *Chairman.*] If you have the large scale you can readily reduce it to the six-inch scale, if you require it?—Yes; but you cannot reverse the operation.

87. Mr. *Stirling.*] Could a map on the six-inch scale be got out and published more speedily than on the large scale?—There is first the trigonometrical operation, and then the chain and field-book work; having got that, you have the entire substance of the survey, and what remains is less important, both as to time and as to money; if you only have a sufficient number of trained draughtsmen and engravers, like the sappers and miners, you may carry on the work at almost any speed you think proper.

88. Therefore the six-inch scale has no advantage over the other in that particular?—No.

89. Its portability is the only thing?—Yes; just as the one-inch map is more portable than the six.

90. Mr. *Dunlop.*] What are the special objects to be attained by the six-inch scale, which could not be attained by the one-inch scale on the one hand, and the large scale on the other?—I consider the special object to be this: the one-inch scale is totally insufficient for all the social purposes of which we have been speaking. The six-inch map is a popular edition of the large scale map, and, as such, it is available for those purposes; but still it will not fully answer them without occasional assistance from the large scale map. The six-inch scale is to the large scale the same thing as the abstracts which young men in public offices are called on by their official chiefs to make of detailed correspondence.

91. And the one-inch scale would not amount to that?—No.

92. Mr. *Ellice.*] I understand you to say, you think the survey should be prosecuted upon the whole of the three scales that are now before us; the 24-inch maximum to be reduced to the six-inch, and again to the one-inch?—As regards the cultivated districts, the survey should be recorded in each of those forms; the large form, speaking generally, I think, should not be engraved; the six-inch should be engraved and the one-inch should be engraved.

93. You recommend, then, the publication upon the six-inch scale?—Yes.

94. And upon the one-inch?—Yes.

95. Do you think that the publication of the six-inch scale is indispensable?—I think it is indispensable in the sense of obtaining the full advantage of the large scale, because, although by devoting a sufficient amount of time and trouble you may obtain all you want from the large scale, yet there is a great practical advantage in having the large scale condensed in a smaller scale; it is like teaching a boy the history of Rome or Greece in an abridgment, in preference to taking up a disproportionate period of his time with the full histories.

96. Of course you are aware of the evidence which was taken upon the Committee in 1851?—I am aware of it generally; I have looked over it.

97. Are you aware that the balance of that evidence vastly preponderated in an adverse sense to the six-inch scale?—Yes.

98. And are you aware also that the opinion of that Committee was a unanimous recommendation against the six-inch scale?—I understand it to have been so.

99. *Chairman.*] As compared to the one-inch?—Yes, as compared to the one-inch.

100. Mr. *Ellice.*] But it was against the publication of the six-inch scale as being a cumbrous and inconvenient form in which to publish the survey, was

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

it not?—Yes, with reference to the considerations before that Committee. I have explained in a former part of my evidence, that they regarded the map as a general map of the country. They used the expression several times "for general purposes," that is as a geographical map, or a map of a whole district, which might be hung up in a hall. It was in that point of view that they objected to the six-inch map.

101. In short, they recommended the one-inch preferentially to the six-inch, in consequence of its being superior as a map of general reference?—Yes.

102. You gave the opinion you expressed just now as to the publication of the six-inch map with the knowledge of the evidence given before that Committee; there is nothing in the evidence given before that Committee which tends to shake your opinion, that the six-inch is the most convenient form of publication?—No; having regard at the same time to the whole of the information that has been laid before the Treasury; the subject has been very fully developed since that time, and we have had much greater advantages than that Committee had, which have enabled us to take a more complete view of the subject.

103. Do you contemplate that the whole of England and Ireland should be ultimately re-surveyed on the large scale of 24 inches?—Ultimately, after Scotland has been completed.

104. You would propose that Scotland should be completed upon the 24-inch scale under the reservations you have made, and that England and Ireland should afterwards be re-surveyed upon the same scale?—That is my opinion.

105. Of course you have not formed that opinion without taking into consideration at the same time its effect in a financial point of view; have you considered at all what such a re-survey of the whole country would cost?—Colonel Colby estimated it in 1852 at about a million and a half, speaking roughly.

106. Was that for the re-survey of the whole country?—The whole of England, including the northern counties.

107. And Ireland?—That would be separate.

108. You do not know what the cost would be there?—No. I form my opinion from the conviction that it would be money well laid out; and I may also mention that the re-survey would be very much facilitated not only by the greatly improved experience and skill of our surveying establishment, and by the much more perfect understanding of the subject which has been arrived at, but by the results of the previous surveys; we should have the six-inch scale to refer to, and the one-inch.

109. As between the one-inch map alone and the survey upon the 24-inch scale, coupled with the publication of the six-inch scale, what is the difference of expense as regards Scotland; of course you have had these estimates given to you at the Treasury?—Yes; but I can only speak from Colonel James's information.

110. I understand you to state that you consider this re-survey of England would cost about a million and a half, exclusive of what Scotland and Ireland would cost, to which you have not particularly directed your attention?—I have made no detailed calculation. Perhaps the Committee will allow me to observe, that in considering how I might best render assistance to the Committee, and on conferring with the Chairman, I came to the conclusion that it would be advisable for me to leave the details of the estimated expenditure to the superintendent of the survey, upon whom both the Treasury and the Secretary of State for War must depend. I have stated that Colonel Colby, in 1852, calculated the cost of re-surveying the whole of England, on the large scale, at about 1,400,000*l.*, in addition to the expense of the six-inch survey of the six northern counties. I have also stated that the expense per acre of the large scale is from 12*d.* to 11*d.*, and of the survey for the six-inch scale, eight pence and one farthing.

Vide Appendix.

111. I was going further to ask what had been already spent in England and Ireland; probably you are not prepared to state that now, but will give us a note of it in some authoritative form?—I will do so; but I may mention that the cost of the past survey is hardly a fair basis for the estimated cost for the future, because the system has been extremely improved and simplified.

112. *Chairman.*] You consider that the system could now be more economically pursued than it used to be, on account of the improvements which have been made since the commencement of the survey?—Much more so.

113. Mr. *Ellice.*] Have you contemplated the time that the re-survey would occupy?—

occupy?—No: according to my view, it should form a permanent portion of the public establishments of the country; I think the State ought always to have a body of trained, skilled, experienced surveyors, employed in conducting the national survey in the form most conducive to the public interests, and in revising that survey according to the growing and altered demands of the time. I consider that that would be money extremely well laid out.

Sir C. Trevelyan, K.C.B.

8 April 1856.

114. Mr. *L. Davies.*] A standing staff?—A standing staff. We know that surveys cost a great deal; we know that the Tithe Commissioners spent more than two millions in their imperfect and unreliable survey of Great Britain, and yet that two millions was necessarily and properly laid out for that purpose.

115. The *Lord Advocate.*] In the estimate which you are going to give in, will you be kind enough to enumerate the amount which has been expended in work which has proved either useless in whole or in part?—It would be impossible to state the whole, because this two millions for the tithe survey is only one item; it is a large item, it is true, but it is not to be compared with the much larger amount which has been unprofitably laid out by private individuals.

116. In this matter of surveying I want to have an approximation of the amount which has been unprofitably expended in consequence of the survey proceeding on principles which are now found to be defective?—Having satisfied myself by a large induction that a national survey, properly conducted, is an economical and profitable operation, I consider that the subject is taken out of the region of pure finance; it is proved that it is an advantageous and profitable thing; of course we should make it as cheap as possible, and avail ourselves of the mechanical improvements that have been obtained; but it is better that one authentic national survey should be made for the whole country than that it should be made piecemeal and haphazard by innumerable public officers and individuals; that is the general financial view I take of the matter.

117. Mr. *Ellice.*] You have told us that the new and improved mechanical arrangements have facilitated very much the surveys and reduced their cost; has that affected the actual expense of surveying at all? or does it merely apply to engraving and publication?—What I had particular reference to when I spoke of that was the improvements which have been made in engraving; for instance, every tree used to be separately drawn, whereas now they are run off by a roller; but a very important reduction has also been made in the expense of the field surveying by the substitution or piece-work for day-pay, and the rate of progress has been accelerated by the same means.

118. With regard to the large scale, you have stated many advantages which it seems to you to have over any other, and among them it will convey to the mind an exact picture of the subdivision of land?—Yes.

119. How long, on an average, do you think a map engraved this year would continue to convey to our mind a correct idea with reference to the subdivision of land?—I cannot give an average of years; but I may make this general observation, that the ancient landmarks are wonderfully durable.

120. I am not speaking of landmarks, but of subdivision of land?—I mean hedges, for instance. I can give several instances of it: in an estate in Leicestershire, which was one of the commanderies of the Knights Templars, a map has come down, and is in the local Record-room, showing what was the subdivision of the fields in the time of the Templars, and the boundaries continue the same to this day. There are places under Dartmoor which go by the name of the New Inclosures, which were made in William the Third's time, and there they are now, without any alteration.

121. Do you not suppose that those are exceptions to the general rule?—I think not.

122. Mr. *L. Davies.*] Supposing these landmarks, as now defined on that map, were changed, would not the area of the ground still remain?—The area would of course remain precisely the same.

123. Mr. *Ellice.*] What I want particularly to draw your attention to is the subdivision of the land; of course the area would remain the same, but what I am speaking of is the subdivision of land into fields. Now as regards Scotland, I suppose you are sufficiently conversant with that country to know that the great agricultural improvements which are now going on there changes its aspect continually?—Yes, taking down hedges is the great change of the present day; but

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

but the permanent landmarks which will remain will enable you to judge of that which is taken away.

124. Could you not judge of those permanent landmarks from a map on a smaller scale than 24 inches?—Not in a satisfactory manner; I contemplate a permanent staff for this purpose; I consider that it should be a permanent Government department, and I would have the map revised from time to time; that was one of the principles which was laid down in the Treasury Minute of October 1840, when the six-inch scale was originally established in Great Britain.

125. I think you said that the Irish survey was at this moment being revised as regarded the sub-division of land?—Yes.

126. That I presume therefore shows that there has been a considerable change in the face of the country which has rendered that revision of the old map necessary?—The reason for the revision was quite different; the original intention of the Irish survey was that it should furnish a basis for the grand jury assessment, the local assessment answering something to our county rate in England; and it was sufficient for that purpose that the boundaries of the townlands, which are the basis of the assessment, or the separate units of the assessment, should be given, and so the survey at first was confined to the boundaries of each townland; but as the survey went on it was discovered that by filling in the fields and homesteads further additional advantages would be gained, and that was the cause of the revision; it was not a revision in the nature of altering anything that had been done, but of adding to it.

127. If this revision is obliged to be periodical, as you contemplate, with a permanent staff for the purpose, how are we to take these maps as of such importance with regard to the transfer of property?—I do not mean that frequent revisions would be necessary, but that they should take place at long intervals, in cycles, say of 25 or 50 years; but even without a revision I consider that these maps would be the greatest possible assistance. I consider that, in the first place, the objects are likely to remain much as they were when they were originally surveyed; in the second place, supposing some of them to be altered, sufficient will remain to furnish an indication of what has been altered, and then will come the revision, which will identify the two; it will say the ground occupied in a map of such a year, in such a manner, is now occupied in such a manner.

128. It occurs to me, that in legal documents transferring property, the utmost accuracy is required; now what may happen at any period during 50 years, may happen to-morrow as well as 50 years hence; how then is this map to be depended on as legal evidence in case of such a contingency occurring?—I would submit, that the difficulties of which we are now speaking, are difficulties which are inherent in the nature of the subject; they apply in the fullest degree to the present system of conveyancing; a conveyance at present describes the property to be conveyed as bounded by such a hedge on the east, and on the west by such a ditch, and so on; in the course of years all those boundaries may be obliterated, and if there is no map which describes the area in a permanent manner with reference to permanent objects, that is, with reference to its bearings with regard to other objects, it may be lost altogether; now, at any rate, our map will be better than the present system; it will give references to objects which remain, which the present system does not.

129. Do you contemplate that the map should be conclusive evidence with regard to boundaries?—Yes.

130. You have mentioned that with regard to the cultivated districts in the Highlands, you take the Highland line for the boundary?—Yes, I spoke generally; I would take what is usually called the Highlands.

131. Take Dunrobin Castle, for instance; I presume you would include that in the large survey?—This is entirely a practical question, and it must be left very much to the superintendent of the survey to determine where the large scale shall end and the six-inch scale begin.

132. You do not propose to make an arbitrary boundary?—No.

133. *Chairman.*] You propose to have it as it is left in the Treasury Minute?—Yes; we all know the gradually decreasing belt of cultivated land which runs up into Sutherlandshire through Easter Ross.

134. Mr. *Ellice.*] You are aware that the Report of Lord Elcho's Committee was against the system of contouring. I think the words were, that the system of contouring should be abandoned?—Yes; that was Lord Elcho's Committee.

135. What reason was there for the contouring being persisted in in Fife, notwithstanding

withstanding the recommendation of that Committee?—Because the evidence before the Treasury at that time, and especially the strong representations of the proprietors and other persons immediately interested, led to the conclusion that the county of Fife ought to be surveyed according to the previously existing system, including the contouring.

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

136. Was there anything said in the memorial from Fife with regard to contouring? What I want to arrive at is, the grounds upon which the Treasury authorised contouring in Fife by a proceeding diametrically opposed to the recommendation of the Committee?—It was equally opposed to the recommendation of the Committee to extend the six-inch scale to Fife.

137. What were the grounds for contouring?—We considered contouring, which is supposed to be the most perfect manner of representing the elevations of the soil, to be an useful and beneficial part of the general survey; and as the Treasury authorised what is generally and popularly called the six-inch scale (that is, the system of survey known as the six-inch scale) to be provisionally continued in other cases, it was not considered advisable to make a distinction between different parts of that system; in fact, we saw no reason for it; we were aware of the public advantages of contouring, and saw no reason for making a special distinction with reference to that part of the survey.

138. You give that answer, having before your consideration Lord Ellesmere's Report, and Sir John Burgoyne's approval of that report, against the system of contouring?—We do not consider that Report to be against the system of contouring.

139. But it is that system of contouring that the Committee reported against?—The report of Lord Ellesmere's Committee perhaps does not go so far in its recommendation of contouring as to adopt the system which was then in progress, but it recognizes and adopts the principle of contouring; and besides that, we had in favour of contouring the recommendations of the Irish committee, which specially considered the subject.

140. Is there any document in existence setting forth the reasons of the Treasury for departing from the recommendation of the Committee?—There are several documents setting forth the reasons of the Treasury for suspending the adoption of the recommendations of that Committee, including the contouring. I may mention that contouring is considered to be specially applicable to thickly populated counties like Fife and Durham, where towns abound, where sanitary operations are especially required, and where the system of drainage connected with mines is very important.

141. All those considerations were before the Committee when they made their Report; what I want to arrive at as a fact is, that the Treasury overturned the Report of the Committee without having recorded any particular reasons for so doing?—They recorded their reasons for delaying to act upon the recommendations of the Committee.

142. That is upon the scale; not with regard to the contouring?—The contouring only forms part of the system.

143. The Report of the Committee made two distinct recommendations, one with regard to contouring, and the other with regard to the scale; as I understand you, the Treasury laid down their reasons for disregarding the Report of the Committee as regards the scale, but did not lay down their reasons for disregarding the Report so far as relates to the other matter?—They laid down their reasons for suspending the adoption of the recommendation of the Committee in reference to all those points, including the contouring; we regarded it as one system; the reasons for contouring are somewhat different from those for the six-inch scale, but they are very powerful reasons.

144. I believe that the Report of that Committee, which was subsequently confirmed by a minute of the Treasury, has never been in any degree attempted to be enforced or put in practice by any of the authorities concerned, from the very beginning?—An attempt was made to enforce it; the Treasury desired the Ordnance to confine their acting upon the system commonly called the six-inch scale to the counties which had been commenced upon that scale; and with respect to the other counties, to adopt the recommendations of the Committee; but we were then met by an overwhelming pressure of representations, requiring the most serious attention, from persons, and bodies of persons, most interested in the question.

145. I understand, from the general tenor of your evidence, that the suggestion

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

gestion of the large scale has emanated from the Ordnance and the Treasury?—No, I should say that it emanated from the Tithe and Inclosure Commissioners.

146. That is to say, from practice not connected with Scotland?—Yes; but the object is so homogeneous, that that system of survey which is best for thickly-peopled and highly-cultivated districts in England, is likely also to be the best for the thickly-peopled and highly-cultivated districts in Scotland.

147. I understand you, in a former answer, to say that it was in consequence of the public opinion having altered, that you adopted the larger scale?—Yes; public opinion gradually grew; as I mentioned, there was a continual growth and progress of opinion upon this subject, commencing with the opinion of those persons who, from their experience and the direction of their habits of thought, were the best judges in the matter.

148. Is it not the fact that the suggestion of the large scale did not originate in Scotland?—I should say not; but perhaps it is not a strictly correct expression to say that anybody suggested it; it grew out of the circumstances. If I must use the expression "suggested," the honour of having suggested it belongs to the Tithe and Enclosure Commissioners, it having been suggested to them by the practical experience of their operations under the Tithe Act. They bore their testimony to it in 1837, before the commencement of their Tithe survey, which cost two millions of money. They again bore their testimony to it in 1852, after the Treasury had resolved upon the adoption of the six-inch scale; and afterwards, when we had to re-open the subject, in consequence of the recommendations of Lord Elcho's Committee against the six-inch scale, and the reactionary movement of Scotland against that recommendation. In the meantime the opinion of the best judges in favour of a still larger scale than six inches had grown and made great progress, and was beginning to influence the authorities at the Treasury.

149. *Chairman.*] The question of the 25-inch survey, as applicable to the whole country, originated in the discussions that ensued at the time of the Tithe Commission, and not with immediate reference to the Ordnance survey of Scotland?—It originated with reference to England, and it was in order to obtain an authentic survey of England for tithe purposes immediately, and for other purposes generally.

150. And it was in consequence of attention being directed to the superiority of the 25-inch survey, as compared with any other, that the Treasury and other parties were induced to adopt it with reference to the Ordnance survey of Scotland?—Yes. Perhaps the most correct way of describing what took place is to say that the Tithe and Enclosure Commissioners, beginning in the year 1837, bore strong testimony to the superiority of the large scale; and by degrees, when the public, owing to various circumstances, had been induced to turn their attention to it, the majority of the best authorities came to the opinion of the Tithe Commissioners.

151. And the subject of the 25-inch survey was never in any way submitted to the Committee of which Lord Elcho was the Chairman?—No, it was not before them; their proceedings show that they did not consider it.

152. Mr. *Ellice.*] Has any new survey been commenced on either of the larger scales since the estimates of last year?—The survey is constantly in progress.

153. In any new county?—We regard it as one survey, continually in progress; we do not inquire at the Treasury when the survey of one county has ended and another commenced; we do not consider that as an epoch of the survey.

154. You have said, with regard to the survey in Fife, that one of the arguments of the Ordnance department for commencing and continuing that upon the six-inch scale was its importance with regard to the hydrographical survey, and the trouble it would save; has there been, or is there, any concert between the Ordnance department, with reference to the Ordnance survey, and the Admiralty in their hydrographical survey of the coast of Scotland?—Yes, there was on that occasion.

155. But is there generally?—Yes, and there was at a much earlier period, in the year 1838 and 1839, when the discussion which led to the establishment of the six-inch scale took place. It was then represented that the hydrographical survey of the mouths of the Clyde and the adjoining estuaries would be much facilitated by the adoption of a larger scale than the one-inch scale, and that was one of the reasons for the adoption of the six-inch scale.

156. Mr.

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

156. Mr. *L. Davies.*] When you spoke of revising the map, you merely meant that if the staff be kept up as a national staff for general purposes, it would be well to employ them at given periods of 25 or 50 years, to correct anything that might have occurred to produce a change in the map in the intermediate periods?—I consider that the principle laid down in the Treasury Minute of the 1st October 1840, by which the six-inch scale was established, is perfectly sound and applicable; it says, "By this means a permanent map will be obtained on a sufficiently large scale to admit of subsequent alterations and improvements in the face of the country, being transferred to the map;" what I mean is, that when we have once got the standard survey of the whole country on a scale sufficiently large to describe all the important objects which ought to be included in a survey, it will be a matter of comparative ease to go over that survey again with a body of experienced and skilled officers, and note the alterations.

157. *Chairman.*] What I understand you to say is, that in your opinion a large body of engineers will probably in future be, as it has been, in the permanent employ of the Government; you think they may be occasionally employed in revising the Ordnance survey of the country?—I go beyond that. I consider that an authentic, detailed, national survey is so important for the efficient and economical transaction of the business of this country, that even supposing we had no corps of Engineers, and no Sappers and Miners, it would still be a highly profitable employment of public money to keep up a sufficient body of experienced skilled surveyors to conduct these operations; but having a corps of scientific Engineers, and a trained and highly efficient body of Sappers and Miners, I think they may be very beneficially employed in this work; and not only will they always be available in time of war, but their military capacity and general intelligence will be much improved by the experience they have acquired on this service. That has been proved in the course of the present war. The War Department has obtained from the body of surveyors the assistance necessary to establish their central office (their military depôt, they call it), for maps and surveys, and so on, at the War Department; they sent a body of them to Kars the other day, to make a survey there with a view to the next campaign, and they sent several to Sebastopol.

158. Mr. *Ellice.*] The question I asked you was, whether a map that had erroneous subdivisions of land marked upon it, would be a document which anybody would attach to a deed conveying property?—My answer is, that a map or plan founded upon an authoritative public survey is better than any other description that can be given of the property.

158. Do you think it better than a private survey made between the buyer and the seller?—I think it is better than private descriptions.

160. Mr. *L. Davies.*] Would it obviously be upon the face of it a better document than a private map, inasmuch as it would be open to the eyes of various people, and would not therefore be subject to that degree of suspicion which would attach to a private map?—Yes; but besides that, it would be a *general* survey; there is a field A, a field B, and field C; we will suppose them all thrown into one; if those three fields had been conveyed by a deed merely describing the boundaries, or even by a private map containing only those fields, in the course of time, when the hedges were obliterated, there might be confusion; but when you come to the public map founded on a general survey, you have not only those three fields, but all the fields, hills, and rivers around, and you can immediately identify the area of the three fields described in the original map, by its bearings upon other objects.*

161. Mr. *Ellice.*] Do you think that could not be done on a less scale than 24 inches?—Not satisfactorily; we must go to the expense of a very expensive survey to get even the one-inch scale; and as we must do that, it is better to do it once for all, and so not only do away with Government surveys, but with a great

* A Northumbrian proprietor left 500 acres to the Grammar School at Morpeth; but, as the 500 acres remained in the possession of successive owners of the estate, who paid some acknowledgment to the school, all trace of the boundaries became lost, and the school lands merged in the estate; the consequence of which was, a law suit which lasted more than 100 years, ending with a decision which bore very hard on the actual owner of the estate. All this would have been prevented, if a general large scale survey had been in existence when the grant was made, because the 500 acres might have been at any time identified by measurement on the map.

Sir *C. Trevelyan*, K.C.B.

8 April 1856.

great amount of unprofitable private expenditure, reserving our time and money for things which would be both profitable and useful.

162. Do you think that the 24-inch scale would supersede the necessity for any person having recourse to a private survey?—Speaking generally, I should say so. I wish to guard myself on one point; in speaking of a periodical revision of the survey, I mean a revision from generation to generation, merely with a view to ascertain the alterations that have been made, and to note them; a much smaller establishment would be sufficient for revising the survey when once it was made, than would be necessary for making it originally; a surveyor would go upon the ground with a sheet of the Ordnance survey in his hand, and would see that at such a place there formerly stood a house which has now been knocked down, and he would note that; and in another place he would see that a hedge had been made which did not exist formerly, and he would put it down. When a national survey has once been well made, it can be maintained at a very moderate cost.

Lieutenant-Colonel *Robert Kearsley Dawson*, C.B., called in; and Examined.

Lieut.-Col. *R. K. Dawson*, C. B.

163. *Chairman.*] WILL you have the kindness to state your position as an officer in the Royal Engineers?—I hold a commission as a Lieutenant-colonel in the Army, on the Retired List of the Corps of Royal Engineers.

164. You are attached to the Inclosure and Tithe Commission, I believe?—I have been so from the year 1836.

165. In what capacity?—As an Assistant Tithe Commissioner, and also as an Assistant Commissioner under the Inclosure Act.

166. I think that in that capacity you have had a good deal of experience in mapping?—I have had the entire charge and conduct of the mapping business of those two Commissions, and also of the Poor Law Board, from the year 1836; I had previously been employed for 17 years on the Ordnance survey, in every department of the business, and superintended the preparation of the plans of the Parliamentary boroughs under the Reform Bill, and of the municipal boroughs in England and Wales. During the last three years I have acted as the professional adviser and assistant of the Treasury on this important subject; and I have been employed also on such subjects by other public departments.

167. You have especially had a good deal of experience in the construction and use of maps on a large scale?—I have; especially those for Tithe and Inclosure and parochial assessment purposes.

168. Sir Charles Trevelyan has stated in his evidence before the Committee, that the idea of a 25-inch scale as applicable to the purpose of a general survey originated with the Tithe Commission?—I have heard the evidence Sir Charles Trevelyan has given, and shall be happy to state the circumstances out of which the recommendation of the 25-inch scale arose. The Tithe Act received the sanction of the Legislature in 1836; I was immediately appointed by the Commissioners an Assistant Commissioner to take charge of their surveys, and was directed to report to them, first, as to the scale which should be adopted for the parish surveys to be made under the Tithe Commutation Act, and secondly, as to the purposes of general utility, besides those of the Tithe Act, to which such surveys might be made applicable, and the probable additional expense which would thereby be incurred. The Tithe Act required that three plans should be supplied of every parish of which the tithes were to be commuted, and that those plans should be so made as to represent accurately the boundaries and acreable contents of every parcel of land or unit of property, however small, upon which a separate rent-charge was to be apportioned in lieu of tithe. That was the requirement of the original Tithe Act; in fact, those plans were to be such plans as are ordinarily made of estates for property purposes, and the scale for maps of that sort I found was generally throughout the country, that which is commonly known as the three-chain scale, and equivalent to 26 $\frac{2}{3}$ inches to the mile. The smaller scale of four chains to an inch, or 20 inches to a mile, I found to be used in some cases; but it was generally admitted among professional men, that that scale was too small to give accurately the information required in all cases; therefore I reported in favour of the 26 $\frac{2}{3}$-inch scale. Then, with reference to the purposes of general utility to which the plans might be applied, when I referred to what had previously been done and recommended on the subject, I found

Lieut.-Col. *R. K. Dawson*, C. B.

8 April 1856.

I found in the Report of the Real Property Commissioners, dated, I believe, about the year 1830, these memorable words with reference to a public map: "Altogether indispensable seems to me to be this muniment; without this for an object or standard of reference, without such an anchor as this to be fastened to, surely to a vast proportion of the landed property in the kingdom will the title remain floating in the ocean of uncertainty. In one part of this vast aggregate the assurances have maps of corresponding extent for their accompaniments; in another part, in the vast remainder, no such means, or say instruments, of identification have place. If necessary or useful in any one instance, where is the instance in which it can be otherwise?" And with characteristic quaintness the writer concludes, "Give me, said Archimedes, but another place to stand upon, and I will give motion to the earth." "Give me, say I, but a map to point to, and I will give rest and quiet to all that inherit this our portion of the earth's surface." As nearly as could then be ascertained, it appeared that about one-fifth of the parishes in England and Wales had already commuted their tithes, and that the Commissioners would have to do with the remaining four-fifths; and as the parishes in the remaining four-fifths would be scattered all over the face of the country, I was fully persuaded that the survey of them would be more satisfactorily, more expeditiously, and more economically conducted, if pursued as a whole, and as a Government measure, upon the same principles and under the same general superintendence. I felt so strongly impressed with the importance of the work itself, and the importance of the occasion, that I made use of these words: "The necessity which now exists" (that was in 1836) "for surveys of nearly the whole country for a specific purpose (that of tithe commutation) presents means for forming a General Survey or Cadastre, at such a cheap rate, that the opportunity cannot be lost without exposing those who ought to represent its importance, to the certainty of future censure, if they fail to perform that imperative duty." I considered it my duty to point out, as forcibly as I could, the importance of the occasion, and of the opportunity which then offered for carrying out a survey of the entire country more economically, as I believed, than it would be possible for the landowners of individual parishes to make maps of those parishes, for tithe comutation purposes alone, by their own unaided means.

169. I believe that, at the period of which you are speaking, the survey of a portion of England and Wales had been completed on a one-inch scale; did you find any great advantage from making use of the maps upon that one-inch scale?—None whatever; they were totally inapplicable to our purpose; for this reason, that the one-inch maps do not, and cannot, represent the fields upon which the tithe rent-charges were to be apportioned.

170. Is it your opinion that a great national survey, conducted only on a one-inch scale, is adequate to meet all that is required by such a survey?—It would be perfectly useless for such a purpose as I am speaking of.

171. Mr. *L. Davies.*] You have spoken of the apportionment of tithe on fields, that is not a common occurrence; the apportionment might take place on a farm, without showing the fields in many cases, and a one-inch map was wholly inapplicable there, was it not?—Wholly; because it does not show the separate properties; it is not a property survey. Having reported to the Tithe Commissioners upon the subject, they referred my report to the Government, and in a letter addressed to the Chancellor of the Exchequer of the day, they said: "The Commissioners have a distinct belief that, for the purposes of the Tithe Act alone, correct plans on a sufficient scale are essentially necessary. For the grounds of that belief, they beg to refer you to the first and second pages of Lieutenant Dawson's report to them of the 29th November." "The Commissioners have to add to the facts and reasonings of Lieutenant Dawson, that their limited experience has already shown that, unless the contents of fields can be computed from the map itself, and compared with the book of reference sent with it, there is no real security for the correctness of either of those documents. The Commissioners have a clear opinion, strengthened by the concurrence of a very great majority of the practical surveyors they have consulted, that, taking the country throughout, a scale of three chains to an inch is the smallest which can be safely relied on for such computations, and they therefore recommend that scale for general adoption." Further on they say: "The preceding statement includes the case, as far as the Tithe Act alone is concerned, but it was understood to be your wish that the Commissioners should state

Lieut.-Col. *R. K. Dawson*, C. B.

8 April 1856.

some other circumstances which connect the conduct of mapping under the Tithe Bill with other important national objects. They do not dwell on the general use of an accurate and minute survey of a nation's territories. At this moment a great proportion of the continental nations have completed, or are attempting it. The Austrian Government has devoted for 17 years 100,000*l.* a year to carrying on a survey, and contemplates a large further expenditure." Then they cite some other instances, and say: "The great amount of local taxation spread over the English soil gives to the landowners and occupiers, that is to a very considerable portion of the people, an interest in the existence of such surveys quite equal to that which is stimulating the Sovereigns of the Continent in their exertions. The present moment is one in which this national interest is distinctly and pressingly indicated by circumstances." They then allude to the poor's rate, and to county rates also, and say: "Apparently it is generally felt that no system of levying these rates, old or new, can be fairly carried into effect without the aid of efficient maps." And, in conclusion, they say: "It seems, therefore, to be a point worthy, at least, of the very grave consideration of the English Government, whether such maps shall be attained at an enormous expense at some future period, or whether the large sum of money which must now be expended in the maps, good or bad, supplied for the purposes of the Tithe Act, instead of being wasted for all other public purposes, shall be so expended as to be the means, as far as it goes, of supplying all the wants of the nation as connected with surveys. To make the maps complete for this extensive usefulness, it seems clear that they must be on an uniform scale, and on a sufficient scale to make them evidence of the contents of fields, estates, and parishes, independently of re-admeasurement; and these conditions imply the necessity of their being conducted under the control of some central authority, and imply, perhaps the necessity of some interference and assistance on the part of the Government. You were pleased to inquire of the Commissioners if any increase of expense or any delay would be occasioned if the whole operation of mapping were placed under the control of this Board. They have reason to believe that the expense would be less. It is obvious that when several parishes are mapped together, their common boundaries need only be once measured; while, if taken separately, these boundaries must be measured twice, a circumstance which, in many thousand parishes, must tell sensibly. Lieutenant Dawson reports that the expense of mapping under his superintendence, when new surveys are required, would not average more than 9*d.* an acre. Individual cases have already been before us, in which the parties have made very improvident bargains for themselves at a much higher rate. There seems no ground for supposing that the operation, so far as the titheable lands are concerned, would be delayed by its being conducted under a central authority. Lieutenant Dawson is of opinion that he could conduct the mapping safely by means of the country surveyors and mappers, provided it was understood that they were in no case to be paid till it was found that their maps were accurate and constructed in strict obedience to instructions. These are the persons who would be employed by the parishes; and their being employed under efficient superintendence, and under circumstances which would make it feasible to take adjoining parishes at the same time, whether they happened to be then commuting or not, would probably shorten, instead of prolonging, the whole operation." The subject met with the concurrence of the Government, and was referred to a Committee of the House of Commons, but the Report of the Committee was unfavourable to it.

172. *Chairman.*] In what year was that?—In 1837. The Committee reported: "With regard to parishes wholly tithe-free, or in which no proceedings can be taken under the Tithe Commutation Act, the Committee have no authority to express an opinion as to the propriety of surveying or mapping them. They consider themselves equally precluded by the terms of their appointment from the consideration of the expediency of a national survey, on the other grounds which have been suggested, both in the evidence and the letter of the Commissioners before referred to." That Report of the Committee was followed by a Tithe Amendment Act, in which the landowners were allowed to make use, for the purposes of Tithe Commutation, of any maps which they themselves approved, the Commissioners being relieved from the necessity of certifying and sealing those maps which by the original Act they were required to do, and thereby making them legal evidence. That was the origin of the first and second class tithe maps. Under the direction of the Tithe Commissioners, I immediately prepared a code

of

Lieut.-Col. *R. K. Dawson*, C. B.

8 April 1856.

of instructions for the preparation of such maps as they would be disposed to approve and seal, and those instructions were immediately afterwards adopted by the Poor Law Commissioners for the preparation of such maps as should be made under the Parochial Assessment Act for their purposes. In the year 1840, the Ordnance surveyors having completed the survey of Ireland, were brought over to this country, and commenced the survey of the six northern counties of England, and also Scotland, on the scale of six inches to a mile. But Sir Charles Trevelyan has explained that the six-inch map had not for its object the fulfilling all property purposes. It had been adopted in Ireland merely as a townland survey, and not as a field survey.

173. Mr. *L. Davies.*] What do you mean by townland?—A townland is a subdivision of a parish, varying in size from 200 to 1,000 or more acres.

174. Does it denote separate proprietorship?—They are very commonly, indeed generally entire estates, and they are stated to contain on an average from 200 to 300 acres. General Colby had proposed a six-inch scale for Ireland, with a view to the representation of these units of 200 or 300 acres each, for which it was deemed to be sufficient; but the valuers when they came to work upon those plans, finding the necessity for having more minute divisions of property, required that the fields should be introduced, which was not intended in the first instance, and the scale adopted for the townland survey was then found too small for the minute divisions of fields; at all events, it was found to be altogether inapplicable to the purposes for which the Tithe Commissioners required maps in England, and they represented as forcibly as they could to the Treasury, and the Poor Law Commissioners joined in the representation, that the maps which the Ordnance proposed to make on the Irish scale of six inches to a mile would be perfectly worthless for their purposes, and for any other property purposes, as they believed. They further expressed their conviction, that if a map on a larger scale than the one-inch was to be made in England it should be made on a scale sufficient to fulfil all property purposes. In 1845, the Inclosure Act passed, and under that Act the Commissioners had power to make use of the maps of the Tithe Commission, but I need scarcely say it was only such maps as had been specially examined and approved and sealed by the Tithe Commissioners, that could be applied to the purposes of the Inclosure Commission. Those maps are, to the best of my belief, perfect and satisfactory; that is to say, the first-class tithe maps; the proportion of first-class maps, however, to the whole number is only about one-sixth. There are at present about 12,000 maps in the office of the Tithe Commissioners, and I believe that of those maps, 2,000 only are first-class maps. Those 2,000 maps would have been better maps, certainly, if they had been founded upon a scientific basis of triangulation, as the maps of the Ordnance survey are, and if they had been made under proper superintendence, supervision, and control; but those maps were only first seen by the Tithe Commissioners when sent to them for the purpose of examination, being then complete. The maps were made according to the instructions which the Commissioners had issued, but the Commissioners had no personal supervision of them during their construction, and therefore those maps, I dare say, will be less perfect than the finished maps of the Ordnance survey; but at the same time they are, I believe, very correct and very satisfactory maps, and I am at a loss to account for an observation which fell from an honourable Member just now, that a map which had been made originally "for the Tithe Commission, and adopted for the Inclosure Commission, was found inaccurate, and that a new map was subsequently required for the purpose of sale."

175. That was with reference to a second-class map?—I ought to have stated that no second-class map has been used for the purpose of inclosure; they must be first-class maps, because the Inclosure Commissioners are forced to certify that they have actually examined the maps and found them correct.

176. Has it not come within your knowledge that maps of the second class, with reference to the Tithe Commission, have been found wholly insufficient for the purpose of the Inclosure Commission?—Yes, in numerous cases. The second-class tithe maps are used only to a limited extent for the purpose of the Inclosure Act, when the landowners agree to accept them as the basis for settling their claims; but for the purpose of setting out the allotments, an accurate and perfect survey is invariably required.

177. So that, in fact, the same parish or district has had the expense of making

Lieut.-Col. *R. K. Dawson*, C. B.

8 April 1856.

a survey twice within a very short period?—That may have been, and it will be found to a still greater extent during the progress of the Inclosure Commission. That Commission will require maps to be made to a very great extent; and the maps of the Tithe Commission, if they had been completed in the way that was suggested and recommended by the Tithe Commissioners at the ourset, as a national work, would have been available for the purposes of the Inclosure Commissioners, and they would not have required to expend those large sums in addition.

178. Would the map on the large scale, which you now suggest to the Committee for adoption, have been available for that and all other purposes?—Undoubtedly.

179. *Chairman.*] If the large scale of 25 inches had been originally adopted all over the country, the additional expense to which you are now referring would have been saved?—Yes.

180. How much did that expense amount to?—I calculate that the maps made for the Tithe Commission have cost the landowners of the country nearly two millions of money.

181. Can you give us any approximate notion of what is the value of the maps of the Inclosure Commissioners?—Six hundred and ninety-seven cases of inclosure have been dealt with by the Inclosure Commissioners, involving an expenditure of not less than 40,000*l.* for maps.

182. If such a system of mapping as is now proposed were at once entered upon, it might arrest, might it not, the progress of the imperfect mapping which is now going on?—I make this statement for the purpose of showing the grounds of the recommendation which I afterwards submitted in favour of the 25-inch scale. The scale adopted by the Inclosure Commissioners is precisely the same as that of the Tithe Commissioners; 26⅔ inches to a mile. In 1845 also, an immense demand arose for maps for the purposes of the Railways; that was the great railway year, and numberless applications were made to the Tithe Commissioners for copies of their maps for setting out railways. Then was found the great inconvenience of the second-class maps. The first-class maps were found to be highly satisfactory; but the second-class maps to a very great extent were worthless. Tracings of the first-class maps were supplied at a cost generally of about 10*s.* a linear mile for the width of country, that was required for the purpose of setting out the road, and those tracings were found to answer the purpose of surveys which in other places cost from 10*l.* to 20*l.* a mile. Assistant surveyors were withdrawn also from the Tithe Commission, and more largely from the Ordnance survey, which General Colby complained of. These surveyors, who were receiving probably 10*s.* a day or less, were eagerly sought for by railway companies, and employed at the rate of three or four guineas. The saving of expenditure therefore which would have accrued to railway companies from the use of public maps, if they had been in existence at that time, would have been something enormous. I believe that hundreds of thousands, I might almost say millions, were expended, independently of the lines that were carried out, on surveys for lines which were got up in a hurry, and abandoned from the want of proper maps with levels applicable to the purpose. In 1846, the Drainage Act was passed, under which two millions of public money were lent for the improvement of settled estates by works of drainage. Afterwards, in 1850 two millions more were lent. Four millions altogether of the public money have been lent for the improvement of estates by drainage, and for those works, public maps, if they had existed, would have been applicable, and would have tended materially to ensure the beneficial outlay, and application of that large sum of money. I do not pretend to say that none of those works can be carried out without perfect maps, or that some of them might not be carried out without maps at all; but maps of some sort I believe to be required in all cases; and undoubtedly if maps had existed they would have been used, and would have materially benefited the public by their application to those purposes.

183. In the cases to which you refer, were the Ordnance maps of England, which were published on the one-inch scale, found applicable at all?—Not at all. I am not prepared to say the six-inch maps would not have been applicable in some cases, but the one-inch maps certainly were of no use. The Drainage Commissioners issued an instruction upon the subject in 1847. These are the words:—"The Commissioners request that you will in every instance direct the attention of the proper party specially to the provisions of the 28th section of the original Act, which prescribe that each certificate of advance shall specify the

the land in respect of which such advance is to be made, and that you will explain to such party the greater facility afforded by a map than by any ordinary particulars for the requisite identification of such lands. You will also direct attention to the advantages which must result to the parties themselves from the adoption of maps drawn on a scale sufficient to admit of the drains and their outfalls when completed, being laid down thereon with accuracy. You will explain the facility which such maps will afford for an easy compliance with the provisions of the 39th section of the Act, and you will also explain that the Commissioners will, on application, supply the requite information as to the best and cheapest construction of maps for this purpose." I may state that it is most important in all drainage operations to preserve a record of the drains themselves, and to know exactly where to meet with them in case of any stoppage taking place, and for that purpose you must have a map constructed with accuracy and on proper principles. Independently of the 4,000,000 *l.* of public money which have been advanced, very large sums have been expended by private drainage companies. There are four companies. The General Land Drainage and Improvement Company, the Lands Improvement Company, the Private Money Drainage Company, and the West of England and South Wales Land Draining Company, carrying out extensive works of drainage, for all of which public maps would be most useful. In 1847 the Law Amendment Society considered the advantages which would be derived from a public map for the purpose of registration of titles. They inquired by a Committee into the subject; and the great expense of the work, and the time required for it induced them to recommend a compilation instead of an original survey and map of the country; they recommended a compilation from the existing maps in the office of the Tithe Commissioners, and from such other sources as they could be obtained; that those maps should be examined and corrected, and that the remaining districts should be surveyed to furnish a complete map of the country. The estimate of the cost of that work was, I believe, about 650,000 *l.* for a complete map on a reduced scale. I was consulted by the committee of the society on the subject, and I suggested that it would be impracticable to combine the maps upon the scale of the first-class maps; that they must be combined on a smaller scale, probably one half; and that was the origin of their recommendation, that the map they proposed should be on a scale of 13⅓ inches to the mile, being half the scale of the first-class tithe maps. In 1848, Lord Langdale called the attention of the Government to the subject of maps in a letter, dated the 30th November 1848, in which he suggests "the propriety of taking into consideration the importance of public maps and surveys, and of making them, if possible, subservient to the various public purposes for which they are required." After mentioning several different Acts of Parliament, he remarks: "These Acts show only some of the very great and important purposes for which good and accurate maps are required. Unfortunately the surveys made and in progress have been made under separate and distinct authorities, each for its particular purpose, without any regard to the other important purposes for which maps are wanting; and in almost every case in which maps are wanting for a purpose not before contemplated, it is found that maps previously constructed at great expense are inapplicable, or not well adapted to the new purpose; and thus, for instance, it happens that if the Commissioners now engaged in considering the questions relating to the registration of deeds or assurances of land should report public maps to be necessary for the establishment of a good system of registration, it is doubtful whether any of the public maps already made could be employed for the purpose." That was another purpose, and a very extensive and important one, to which a national survey on a large scale might be applied. In a report of the Commission on the subject in 1850, (Lord Langdale's Commission), they say, "We think that the use of public maps would also lessen the expense of investigation of title, and conduce to conciseness as well as precision in conveyancing. One of the chief causes of expense and delay upon a purchase under the present system arises out of the necessary investigation into the identity of the property to which title is shown with the property contracted for, and the result of this investigation is in many instances unsatisfactory. It very frequently happens that a person looking into his earlier written evidences of title does not find on the face of them any description by which he can recognise the land he desires to sell, or any sufficient reference to any other permanent

Lieut.-Col. *R. K. Dawson*, C. B.

8 April 1856.

evidence by which it can be identified. The title, in such a case, in reality depends on the parole evidence by which it can be identified; the title, in such a case, in reality depends on the parole evidence by which the possession or enjoyment of property can be connected with the written instrument. Even in recent and comparatively careful conveyances, the description commonly consists of references to temporary circumstances, such as tenancy or occupancy, or the state of cultivation, as to which extrinsic evidence must be relied on, and after a lapse of time must be sought for in vain. The evidences of title, in these cases, are the solemn declarations of aged persons as to occupation, reputation of ownership, and the like, obtained *ex parte*, sometimes by means of leading questions, and always without cross-examination. This evidence, untrustworthy as it is, becomes frequently difficult to obtain, as, from the changes among inhabitants in some places, aged witnesses cannot be found. Frequently the difficulties arising from this source occasion suits, and more frequently a delay in the completion of the purchase, injurious to both parties. It must be admitted that the use, in many instances, of private maps in modern conveyances has tended to lessen the chance of future obscurity as to parcels; but the formation of a map, with due precautions for accuracy, involves considerable delay as well as expense in completing a purchase; and as the advantages of it are prospective, and often overlooked by persons not familiar with the subject, there is great temptation to dispense with it. In the case of a small property too, a private map, which is confined of course to the land intended to be conveyed, frequently does not show its position in reference to any permanent objects; and, after the removal of fences, upon its incorporation with an adjoining estate, the evidence of identity which such a map affords would fail. We cannot but hope, that after the use for some time of a public map for the purposes of registration, the difficulties as to the identification of parcels will wholly disappear. In conveyances framed after the commencement of the register, the public map will be of necessity referred to upon the registration of each conveyance, and the general sense of convenience will lead to its being referred to in the conveyance itself. It is obvious that this mode of reference will tend greatly to shorten deeds, of which the description of parcels at present frequently forms the longest part: as no other mode of description can be at once so short and satisfactory as a reference to a delineation of the land itself, correct and permanent, and always accessible." About that time also the Board of Health required surveys to be made in many parts of the country for sanitary purposes, and they found the six-inch maps of the rural districts and the five-feet maps of towns, made by the Ordnance department, insufficient for their purpose; and it was eventually settled by them that the scale of 24 inches should be adopted for rural districts, and 10 feet to the mile for towns. The scale of 10 feet for towns was based in a great measure upon the experience of the Metropolitan Commissioners of Sewers, for whom a map had been made by the Ordnance department on the five-feet scale; it was only a skeleton map, what was called technically a block plan, showing the streets only and frontages of the houses; and in attempting to complete that map by filling in the detail, which was left to the surveyors acting under the Commissioners of Sewers, they found the scale too small to be used satisfactorily, and enlarged the map to the 10-feet scale. It was stated also that at Liverpool it had been found necessary to make a map even on a larger scale, but those were the scales the Board of Health finally determined on using. In 1851 the Scotch Survey Committee reported in favour of the one-inch scale, and against the six-inch scale, which would appear to be rather retrograding, but it has been shown that the six-inch scale had not been selected with reference to property purposes, and if the evidence be looked into it will be found to be conclusive in favour of a larger scale than six inches. At page 28 of the Blue Book of "Correspondence," in my letter to Lord Elcho, I say: "In obedience to your request that I should state my opinion as to the value of the six-inch scale for those general purposes to which a national survey is applicable, and what scale I should be disposed to recommend for the survey and publication of the map of the cultivated districts of Scotland, and of the six northern counties of England, I have the honour (by permission of the Master-general of the Ordnance) to report, that in considering the value of the six-inch scale, and the superior fitness of that scale, or any larger scale, for general national purposes, it appears to me important to trace the circumstances which first led to the adoption of the six-inch scale for the townland survey of Ireland, and subsequently

quently to the adoption also of the same scale for the surveys now in progress in the north of England and Scotland; and in explanation of those circumstances, I would beg to refer to the evidence taken before the Ordnance Survey (Scotland) Committee." I based that report in a great measure on the evidence taken before the Ordnance Survey (Scotland) Committee; and having all these circumstances which I have now stated in my mind, and seeing the demands which had arisen from time to time, during my own experience and within my own knowledge, for a scale applicable to property purposes, when I was sent for by Lord Elcho, and asked my opinion as to the scale which should be used in the north of England and Scotland, in reference to the memorials which were then pouring into the Treasury for the restoration of the six-inch scale, I explained as forcibly as I could the necessity for a map on a still larger scale; that the decision of the Scotch Survey Committee had reference simply to the two scales, the one-inch and the six-inch; and that the conclusion come to was a perfectly just one as between those two scales, because I considered the six-inch scale as little better than the one-inch scale for property purposes, and that what was really required was a map on a much larger scale, the cost of which by piece-work or contract should not be much greater than had been estimated for the six-inch scale; and I urged, as strongly as I could venture to do, resistance to any further concession of the six-inch scale until it could be ascertained whether the public would not desire a much larger scale. Lord Elcho quickly apprehended the reasons, and adopted my views in favour of a much larger scale, as is shown by his official memorandum at page 22 of the printed "Correspondence," and at my suggestion a letter was written to several professional gentlemen who had before recommended the six-inch scale, with special reference to the 12-inch scale which had been advocated before Lord Langdale's Commission by the executive officer of the Ordnance survey department at that time. The answers received were generally in favour of a larger scale; and the letters so received in reply, together with my report, and the previous correspondence which had led to the establishment of the six-inch scale in England and Scotland, were circulated through the country to public departments and professional men; and, in fact, to all whose opinion was considered valuable and to have weight on the subject. The question put was: the map on the one-inch scale being granted, what scale ought to be adopted for a larger map? Should it be a six-inch scale, or any larger scale? The replies to that circular were conclusive in favour of a much larger scale, and showed that that larger scale should be either 24 inches or 26 $\frac{2}{3}$ inches to a mile. The majority of the replies were in favour of those two scales. It was then suggested by me to the Treasury, that instead of taking either one or the other of those two scales, it would be better, upon the recommendation of the Statistical Conference at Brussels, that the scale should be selected, not with reference to inches or miles, or to any other conventional unit of measure, but with reference to the actual linear measure of the ground; and taking an intermediate scale between the 24 inches and 26 $\frac{2}{3}$ inches, the best decimal proportional scale that appeared was that of one two-thousand-five-hundredth of the measurement of the ground; that was the scale which was unanimously agreed to at the Conference at Brussels in 1853, at which the representatives of 26 states were assembled, and they unanimously agreed to the scale of one two-thousand-five-hundredth for national plans.

184. Do you think that the adoption of the 25-inch scale for the survey of Scotland would be a wise and economical measure, so far as the Government is concerned?—Undoubtedly; and I think it would meet with general concurrence, not in this country only, but throughout the Continent; that scale is equivalent to 25 $\frac{1}{3}$ inches to a mile. A second circular was then sent, and it being suggested by Sir Charles Trevelyan that the question was a professional one in which surveyors and engineers were principally interested, who had previously declared themselves in favour of the 26 $\frac{2}{3}$-inch scale, 100 additional circulars were sent to engineers and surveyors; and the result was decidedly in favour of the 25 $\frac{1}{3}$-inch scale, and in answer to the additional question, whether a decimal scale would be productive of any practical inconvenience, that it would not.

Mercurii, 9° die Aprilis, 1856.

MEMBERS PRESENT.

Viscount Duncan.
The Lord Advocate.
Mr. Evelyn Denison.
Mr. Stephenson.
Mr. Lloyd Davies.
Mr. Stirling.
Mr. Dunlop.
Mr. Edward Ellice.
Mr. William Lockhart.
Mr. Leicester Vernon.
Mr. Baxter.

VISCOUNT DUNCAN, IN THE CHAIR.

Lieutenant-Colonel *Robert Kearsley Dawson*, C. B., called in; and further Examined.

Lieut.-Col. *R. K. Dawson*, C. B.

9 April 1856.

185. *Chairman.*] HAVE you any further suggestions to offer to the Committee?—I beg to hand in a statement (A.) of the monies actually paid in to the Tithe Office for copies and tracings of maps, and on account of fees for inspection. This is an important document, as showing the extent to which the general public actually benefit at present by the imperfect maps in the Tithe Office; and it may be assumed that they benefit also to a like extent by the copies of those maps officially deposited in the Bishops' registries, and in the several parishes. The Committee may hence be enabled to judge of the far greater benefit which may be expected to arise from the published maps, sold at about one-tenth only of the cost of mere tracings, which are the cheapest copies supplied by the Tithe Office.

(A.)

STATEMENT of MONIES paid into the Tithe Office for Copies and Tracings of Maps, and an Account of Fees for Inspection.

YEAR.	For Copies and Tracings of Maps.	Fees for Inspection.	YEAR.	For Copies and Tracings of Maps.	Fees for Inspection.
	£. s. d.	£. s. d.		£. s. d.	£. s. d.
1841 -	617 11 5	—	1850 -	759 4 –	171 10 –
1842 -	1,010 7 11	—	1851 -	808 2 10	180 7 6
1843 -	609 15 3	—	1852 -	810 16 –	228 10 –
1844 -	1,122 13 8	—	1853 -	1,145 6 2	289 10 –
1845 -	1,755 18 1	—	1854 -	1,219 2 2	205 5 –
1846 -	657 16 –	135 19 –	1855 -	1,377 10 7	226 – –
1847 -	871 – 6	157 12 –			
1848 -	652 3 7	130 17 6			
1849 -	771 7 –	144 – –	£.	14,188 15 2	1,869 11 –

10 April 1856.

Robt. K. Dawson, Lt.-Col.,
Assistant Tithe Commissioner.

I should wish now to make a few further suggestions with reference to two purposes which have occurred recently, and will continue to call for maps on a large scale: I allude to the altered instruments of tithe apportionment, and to the exchanges of lands which are effected under the Inclosure and Tithe Acts. The altered instruments of apportionment, of course, have reference in each case to the map which accompanies the original apportionment; but it will frequently happen that where properties are considerably subdivided, the original map, particularly if it be an inaccurate map or a second-class map, is wholly insufficient for the purpose. It will frequently happen that properties are, for building purposes, subdivided; that a single parcel of land is cut up into 40 or 50 separate parcels, which, when sold for building purposes, become of great value; and, of course, it is highly important to ascertain with great accuracy the particular acreage of those parcels of land, and none but very accurate plans will then answer the purpose. With regard to exchanges under the Inclosure Act, very many of which are now made:

186. Mr. *L. Davies.*] Will you explain how that is done?—Powers are given by the Act to the Inclosure Commissioners to effect exchanges of land.

187. Without expense?—At a very trifling expense; there is little or no expense attending the search for title, because the lands are held, in each case, under the original title; and in consequence of the facilities afforded by the powers given, exchanges of land are made to a great amount, and they are very numerous. The exchanges are required to have maps, and the map becomes part of the title-deed; it is highly important, therefore, that the maps should be more accurate than the second-class tithe maps; they should be such maps as would have been made under the Government survey which I proposed in the year 1836. Parties having only limited interests in lands, and who find it impossible to effect exchanges by any other means, are enabled to exchange them under the provisions of the Inclosure Act. I would say, further, with reference to the final decision upon the correspondence in the Blue Book by Sir John Burgoyne, Mr. Blamire, and Mr. Rendel——

188. *Chairman.*] You are referring now to the Blue Book of 1854?—Yes.

189. Mr. *Denison.*] The ultimate decision upon this question was come to upon the judgment of those three gentlemen?—Yes; the replies communicated to the Treasury were referred to a Committee of three persons, Sir John Burgoyne, Mr. Blamire, and Mr. Rendel; and their judgment, will be found at page 343, that "The weight of evidence contained in the printed correspondence submitted to us is decidedly in favour of the scale of $\frac{1}{2500}$ of the linear measure of the ground to be mapped."

190. *Chairman.*] What is that scale in our language?—Twenty-five and one-third inches to a mile. Of that Committee, Sir John Burgoyne and Mr. Rendel, two out of the three, had previously recorded their opinions in favour of the six-inch scale, and they arrived at the conclusion that the evidence was decidedly in favour of the larger scale of 25 $\frac{1}{3}$ inches to the mile. The statements which I have made are, to a considerable extent, given in evidence in the Blue Book; but beyond what I have stated, there is a vast mass of valuable evidence in it, which appears to me entitled to greater weight than any evidence which could be taken in Committee, because the book conveys the deliberate opinions of the parties; the deliberate expression of their matured thoughts, which are therefore entitled to the greater weight. Very important conclusions have been arrived at in the evidence, affirming principles which it would appear to me may safely be taken into consideration by the Committee with reference to this subject; and, having myself gone very carefully into the matter, I may be allowed perhaps to state them: first, that a survey and map, to provide for the purposes which a national survey ought to subserve (that was the question put by the Treasury circular), should be a property survey and map; that is the great principle established by the circular, and the conclusions which, speaking professionally, I draw from the evidence in the Blue Book are——

191. Mr. *L. Davies.*] You draw those conclusions, not from the opinions which are expressed, but from the facts on which those conclusions are founded?—Yes; from the whole mass of evidence in the Blue Book. Firstly, the property survey. Secondly, that the scales, to meet all known purposes and probable future requirements, should be 24 inches, or 26$\frac{2}{3}$ inches for rural districts, and about 10 feet for towns (those were the limits arrived at by the first Treasury circular). Thirdly, that the scales should be determined, not with reference to inches or miles, or to any other conventional unit of measure, but as bearing a definite proportion to the actual measurement of the ground; and that they should be decimal scales; these are important principles, as it seems to me, for the guidance of the Committee. Fourthly, that the most perfect proportionals, approaching to the 10-feet scale, and within the limits of 24 inches and 26$\frac{2}{3}$ inches, are those of $\frac{1}{500}$ for towns, being .002, equal to 10 feet 6$\frac{2}{3}$ inches to a mile, and for rural districts $\frac{1}{2500}$ or .0004, equivalent to 25 $\frac{1}{3}$ inches to a mile. Fifthly, that the scales for publication should be half those of the draft plans.

192. Mr. *Stephenson.*] That is 1 in 5,000?—Yes, or 12$\frac{2}{3}$ inches to a mile. Sixthly, that the several scales should be definite proportionals of one another. Seventhly, that the maps should have recorded upon them numerous surface levels in feet and decimals, laid down with great accuracy on certain principal lines, and at defined prominent points ——

193. Mr. *Denison.*] Do I understand that to be different from the contouring principle?—

Lieut.-Col. *R. K. Dawson*, C. B.

9 April 1856.

principle?—That is the result of the Committee in opposition to contouring; it is their recommendation.

194. Not contouring lines, but that there should be figures marked?—Yes, not contouring lines, but positive levels laid down with great accuracy, "on certain principal lines, and at defined prominent points, selected upon some well-established principle;" afterwards described to be "upon roads and highways, railways and canals, and on bridges, milestones, churches, and other substantial buildings, tops of hills, and all well-defined summits, as well as along streams and watercourses." Eighthly, That the features of the country, on the one-inch map, should be represented by means of hill-sketching on the ground and hill-drawing on artistic principles; those are the principles elicited and established by the evidence in the Blue Book.

195. I understand you to have said that the scale for publication is to be half the scale of the large survey?—That refers to the property survey; the one-inch map is a general geographical survey, distinct from the property survey.

196. But that goes on equally with the other?—Yes; in the first Treasury letter, it was stated that the one-inch scale would be granted under any circumstances; and the question was with regard to a second map, whether that should be on the six-inch scale or on any larger scale. Speaking again, professionally, there is no doubt on my mind that if the question were now proposed for the first time, the scales for maps in accordance with those principles should be, for towns $\frac{1}{500}$ of the linear measure of the ground:

197. Mr. *Vernon.*] You are now giving us your own opinion in contradistinction to that which you have deduced from the book?—This is my deduction from the evidence; my opinions are already expressed, and it appears to me that the opinion of the public having been sought and obtained, the question becomes a national question, and must now be decided upon the evidence contained in the Blue Book, and that the time for the expression of individual opinions has passed.

198. Mr. *L. Davies.*] I understand you to say that this was the deduction that Sir John Burgoyne, Mr. Blamire, and Mr. Rendel came to?—They decided on the scale for rural districts; for towns they did not report; the opinion asked of the public was, "What scale do you recommend for the draft plans, and what scale do you recommend for publication?" The evidence in reply to the second question is, for publication one-half of the draft plan or $\frac{1}{5000}$.

199. Mr. *Ellice.*] In popular language, that is the 12-inch scale?—Twelve inches and two-thirds. Carrying out that principle, the general geographical map, now published on a scale of one inch to a mile, should be $\frac{1}{50000}$, equivalent to an inch and a quarter to a mile; and the index map, published on the scale of 10 miles to an inch, should be $\frac{1}{500000}$. The scales would then be proportionals of one another, which, if nothing had been done, would doubtless be the proper thing. I do not wish to press that now upon the Committee, or to urge my individual opinion upon it; I merely state that those scales, which are in regular progression, would be satisfactory for all purposes, and in accordance with the practice of foreign countries, and with the advanced state of science at the present time.

200. Mr. *Vernon.*] Do I understand you that that is what you would propose if you had to begin *de novo*?—I think those are the scales that should then be adopted. The opinion of the Committee may be influenced by what has been already done; a large portion of the country has been already published on the scale of six inches to the mile, and that may affect the determination of the question as to the intermediate scale which is proposed. It is strongly urged in the correspondence that there should be an intermediate scale between the large scale and the one-inch scale; and the question for the Committee to decide is, what that scale should be. I should not myself attach any importance to what has been already done in reference to a great question of this kind; and my opinions, which are very decided upon the subject, I shall be happy to communicate if the Committee call upon me to do so, more particularly with regard to another subject, which was mentioned yesterday in this room, and is referred to in the Blue Book also, viz. the question of contouring; I have a decided opinion adverse to contouring, but I do not wish to urge that opinion until I hear to what extent the question is to be revived, unless I am called upon to do so.

201. Mr. *Denison.*] Has contouring been continued of late years?—I am not now connected with the Ordnance department, and cannot say, but I had understood

Lieut.-Col. *R. K. Dawson*, C. B.

9 April 1856.

stood that the question of contouring was finally settled by the decision of Lord Ellesmere's Commission, which was specially appointed for the purpose, and sat in 1854. The evidence submitted to that Commission, and their decision, are published in the Blue Book. I may state, that after a satisfactory conclusion had been arrived at as respected scales, the question of contouring still remained to be considered, and it was specially referred to a Commission, consisting of Lord Ellesmere, Lord Wrottesley, Mr. Brunel, Sir John Burgoyne, Sir Roderick Murchison, Sir Henry De la Beche, Mr. Vignolles, Professor Gordon, and Mr. Rendel. They reported on the 20th of July 1854, and the executive officer of the Ordnance survey, and myself, were specially ordered to be in attendance on the Commission, to furnish any requisite information on the subject:

202. Your opinion, I understand you to say, is unfavourable to the system of contouring?—Decidedly so, and the question was between my opinion and the opinion of the Ordnance survey department.

203. Mr. *L. Davies.*] Your opinion, I understand you to say, is, that for rural districts the 25-inch map is the one for adoption?—Yes.

204. And for towns?—$\frac{1}{500}$.

205. In short language, that is 10 feet?—Ten feet six inches and two-thirds.

206. Would you advise, having reference to that mass of evidence and your own experience, the preparation of any intermediate map?—So far as I am professionally employed, I do not require it. The large map is the map to which I attach the greatest importance, because from that map maps on any smaller scale can afterwards be prepared.

207. Supposing the Government were to take up this question, do you think there would be any national advantage derived from any intermediate map being contemporaneously prepared with a larger and a lesser one?—I think it would afford great practical convenience, and would be well worth its cost.

208. What size do you propose for that?—My opinion is in favour of a map on half the scale of the draft plans, or $\frac{1}{5000}$.

209. Mr. *Ellice.*] Would you propose the publication of the map on the large scale of 24 inches, and the half scale of 12?—I believe it would be attended with great practical convenience, and that the expense would be defrayed by the sale of the maps.

210. If it should be determined that only one of the two should be published, which would you prefer?—Undoubtedly the large one.

211. *Chairman.*] That is the 25-inch one?—Yes. My recommendation, which is contained in the Blue Book, was in favour of a large map upon the 24 or 25-inch scale, and that the scale of the map for publication should be half of that; with the understanding that the original map should be preserved for reference, and that parties should be allowed to take copies of it for any purposes that might be required.

212. Mr. *L. Davies.*] You did not mean to advise the publication of the large map of 25 inches?—I did not originally advise it; that idea has since been entertained in consequence of the proposition to do it by the lithographic process.

213. Mr. *Ellice.*] But, of the two, you think that the publication of the large map would be of the greatest importance?—It is undoubtedly the most important to obtain that map.

214. My question applies to the publication; which do you think it is most important, with a view to the public interest, should be published of the two, the 25-inch or the 12-inch?—Decidedly the 25-inch, if one only is to be published.

215. Mr. *L. Davies.*] Would the publication of the 25-inch and the publication of the 12-inch be expedient, in your judgment?—I think that practically it would be found extremely convenient to publish both.

216. Owing to its portability?—The 12-inch would be more portable, and it would be useful as a means of reference for all property purposes, although not giving the acreage with that degree of accuracy which for such purposes is required.

217. Have you turned your attention to the great bulk of the 12-inch map and its unportable character?—I have; but to that I attach no importance, because it would never be put together as a whole, or to any great extent.

218. That being the case, what is the use of publishing two maps, one 25 inches and the other 12, which could not be made available for purposes which require a portable map?—It has been found useful hitherto; the maps which have been made under the General Inclosure Acts (and some thousands have been

Lieut.-Col. *R. K. Dawson*, C. B.

9 April 1856.

made) are upon the scale of 26 ⅜ inches, but it has been the invariable practice to reduce those maps to the one-half scale for the purpose of reference.

219. You propose the publication of a one-inch map as a reduction from these?—That would be published under any circumstances.

220. What do you say as to the six-inch map, which seems to have attracted a great deal of attention in that book?—The six-inch map I do not look upon in the light of a property map.

221. Why?—It is too small to give the details required in a property map, and it is too large for a general map.

222. Mr. *Ellice.*] You heard Sir Charles Trevelyan's evidence?—I did.

223. And therefore you disagree with him in that part of his evidence which refers to the publication of a six-inch map?—I think the 12-inch map is a much better map; and that is the scale which public opinion, as expressed in the Blue Book, calls for in preference to the six-inch.

224. Mr. *Denison.*] You have said that of these large scales you consider the 25-inch to be the most important, and the one which you would recommend to be published; to whom would the 25-inch map, if published, be useful?—It would be useful for all property purposes, and for general reference.

225. It would be useful to individuals for purposes connected with property?—Yes.

226. If it was useful to every individual with reference to his own property, it would be useful in that way collectively to the whole community, supplying each of them with a plan of his own property, but could you say that anybody wanting a map would seek a map on a scale of 25 inches?—Not as a geographical map, certainly; but it would be useful for all such purposes as I have enumerated, beginning with the commutation of tithes, rating throughout the country, inclosures, drainage, and all purposes of property.

227. Was that the principle upon which the original map of the Ordnance survey was founded?—It was not; the original one-inch map was a mere military map—a travelling map.

228. It would be a complete change, would it not, of the principle upon which the Ordnance map was established?—But the property principle was introduced with reference to the survey of Ireland, though imperfectly, because there it had reference simply to townlands, which are of an average size of 200 or 300 acres.

229. *Chairman.*] Upon what principle was the Ordnance survey with regard to Ireland established?—It was established on the principle of representing the boundaries and the acreage of the townlands, the boundaries being represented by the map, and the acreage being obtained, not by calculation from the map, but by calculation from the measured distances on the ground.

230. Mr. *L. Davies.*] But the map would not represent the quantity?—The six-inch scale was inadequate to the purpose of computing the areas from the map; it was used only as a general check on results obtained by calculation from the ground measurements.

231. But it had no accurate reference to the exact quantity?—No.

232. Mr. *Ellice.*] The Irish survey was originally begun upon the six-inch scale, with a view to the publication upon the one-inch scale, was it not?—No; I think the publication on the one-inch scale was not then determined on.

233. *Chairman.*] Do I understand you to say, you do not think the publication of the map on the 25-inch scale would be generally useful?—Not as a geographical map.

234. But it would be most useful, would it not, for other general purposes?—Most useful, and had such a map been made when it was recommended by the Tithe Commissioners in 1837, enormous sums of money would have been saved to the country.

235. Mr. *Stephenson.*] Do you conceive that a 25-inch to the mile map is sufficient to make the property intelligible to the proprietor himself, or would he not, as he does now, lay his own property down on a much larger scale?—Not larger than that; it is the usual scale for estate surveys; it is practically the same as the three-chain scale; the three chains being 26 ⅜ inches to a mile.

236. Is that the usual scale for property surveys?—Yes.

237. Does that apply to mining as well as to agricultural property?—I believe that the same scale is used in mineral districts, or it may be a much larger scale.

238. Is it not the fact that in all mining property it is double that scale, so that

that a 25-inch map would not apply to the mining property of the country?—The mines themselves may require other plans to be made on a larger scale, but they would not be required for the surface of the country.

239. In carrying on mining works under-ground it is absolutely necessary, is it not, to know where you are, and therefore it is necessary to have the surface plotted on the same scale?—Then the mining surveys would assume the character more of town surveys, and therefore they must be on an exceptional scale.

240. Therefore the 25-inch scale would not be applicable under those circumstances to any mining property?—It is possible that a still larger scale may be desirable for mines, but I have not had experience on that branch of the subject.

241. As to the 12-inch, do you propose that to be a good geographical map; or in what way does it affect the one-inch map?—It is not the scale for a geographical map, and would not affect the one-inch map at all.

242. To what purpose would a 12-inch map be really applicable, in your opinion?—It would be useful in all cases for reference where mere reference to property is required, and where it is not necessary to compute from it the actual quantities.

243. Of what nature would a reference of that kind be which the larger plan would not equally well supply, if not better?—You would deal with a greater scope of country, and that is what I understand to be the great advantage to be derived from the six-inch map.

244. If it be to aid the eye, then the question would be whether an inch scale does not give the eye a better geographical notion than even a 6-inch or a 12-inch scale; what is your own feeling about that?—The one-inch map does not contain the details which would be given upon the larger map.

245. But when you once enter upon detail, would not the 12-inch map be insufficient to give you special information, for which you would be compelled to refer to the 25-inch map?—Decidedly.

246. Mr. *L. Davies.*] The only purpose then of the 12-inch map would be that you would group in half the space what you would have in the larger?—Yes, in one-fourth of the space.

247. But still, if you wanted to go into details you must go to the larger map?—Yes.

248. And the only advantage which the small one would present would be, that you would not be obliged to refer in detail so often to the large one?—Yes.

249. But if you did you would obtain in the large one all that a 12-inch could supply?—Yes; and you would further obtain in the large map the means of computing areas; but it would not serve so well as an engineering map for more general purposes.

250. The *Lord Advocate.*] We understand that the 25-inch scale is the least scale upon which the areas can be measured with any efficiency from the plan?—It is.

251. On the other hand, is a 25-inch scale, in your opinion, large enough for all general practical purposes?—For all purposes with which I am acquainted.

252. There may be special cases, like those of mines, which may require a larger scale; but those would be exceptions?—There may be special cases of that sort which might require to be dealt with as exceptional cases, but they have never come under my knowledge.

253. And from that 25-inch scale a reduction might be easily and cheaply made to any other lower scale?—Yes; the 25-inch is the scale which to me appears the most important, if it be published in that size.

254. Mr. *Denison.*] Can you reduce with ease, and without expense, from a 25-inch survey to a 1-inch?—Yes, you can always reduce to any smaller scale that may be desired; having a parent map on a large scale, you can prepare maps from it, by reduction, on any scale.

255. Mr. *Stephenson.*] But would you not have to replot the intermediate scale?—No.

256. You would plot on the large scale?—Yes, and reduce by the pentagraph.

257. From a 25-inch to a 1-inch?—Yes; there might be possibly a second operation; you might not reduce at once from the 25-inch to the 1-inch, but might have some intermediate stage or stages.

258. Would you be able to reduce, without the necessity for going on the ground again?—Yes, certainly, without any second plot.

 259. What

Lieut.-Col. *R. K. Dawson*, C. B.

9 April 1856.

259. What map would you think the best for the delineation of the features of the ground by hill-sketching on the ground and hill-drawing on artistic principles?—I should prefer the one-inch map.

260. To adopt the 12-inch scale, would you be disposed to abandon all that has been already executed with reference to the six-inch scale?—I should certainly do so if I contemplated that the work would eventually be carried over the whole of England; if it be for Scotland alone, the judgment of the Committee may be influenced by the quantity of work that has been already done there. I do not know how much has been done; and mine is rather a professional opinion, apart from considerations of expediency.

261. Mr. *Ellice.*] You said that the large scale would be a great advantage in rating; will you tell me in what way it would assist in levying assessments?—In determining the accurate acreage of the land.

262. But rating has to do with value, has it not?—Yes; and the value of a field depends upon the number of acres it contains, and the value per acre.

263. You stated in your evidence yesterday that millions have been expended on railway surveys that would have been unnecessary if there had been this large survey in existence at the time?—I might not, strictly speaking, be justified in using the word "millions," but I have reason to believe that the monies expended on surveys for railways, within the last 20 or 30 years, would have been sufficient, under proper management, to pay for a cadastral survey of the entire kingdom.

264. Do you contemplate that if this large survey upon the 25-inch scale had been in existence at the time when surveys for railways were so prevalent in this country, that plan would have satisfied the requirements of the Standing Orders Committee of the House of Commons?—I have no doubt that it would have done so. I believe the Standing Orders require a scale of about 13 inches to a mile.

265. And you think that that plan would have been sufficient?—Yes.

266. I suppose the whole of your evidence is given in contemplation of extending this 25-inch scale to the whole country?—Yes, decidedly to the whole country.

267. You think that there are increased advantages in the case of England, sufficient to warrant that renewed survey, and the additional expenditure which would be occasioned by it?—I do. It would have been of incalculable benefit to the country, in my opinion, if such a survey had been made when recommended by the Tithe Commissioners in 1837. I have described the numerous purposes which have since sprung up, all requiring maps of that sort, which purposes would have been satisfied by such maps had they been in existence.

268. My question is, whether you think there are now sufficient advantages to be gained to warrant so large an expenditure as a resurvey of England would occasion?—I do, and with reference to the single purpose of registration, which is a very important question, I think that would, in itself, fully justify the expenditure. There are other purposes, also, for which it would be useful, such as the collection of agricultural statistics, and rating.

269. Do you think it of importance that both Ireland and England should be resurveyed on this large scale?—I do not speak of Ireland; I am not competent to judge of that; but with regard to England I speak very confidently, more particularly as it has now been ascertained that the cost of the survey upon that scale will not be more than had been estimated for the six-inch scale.

270. Mr. *L. Davies.*] Do you believe that, if any other than that sized map which you contemplate were now to be executed, a necessity would be perpetually arising for large maps in future times?—I am confident that there would still be a necessity for such large maps for any purposes which required the accurate acreage to be given; that is clearly and distinctly my opinion.

271. Mr. *Lockhart.*] In recommending the 12-inch scale, did you advert to the fact that there would be a necessity for extending that 12-inch scale all over the Highland districts of Scotland?—I do not wish to be understood as recommending the 12-inch map, otherwise than as a concession to the expression of public opinion in the Blue Book; I am most anxious for the large map, and, if that is obtained, I am comparatively indifferent as to the 12-inch map; but, at the same time, I must think that the 12-inch map would be attended with great practical convenience, and that the cost of it would be repaid by its publication. My recommendation of the large scale of 25 inches has been confined strictly to the

the cultivated districts of Scotland; for the mountain district the one-inch scale would, in my opinion, be sufficient for a general map. I think that the survey should be pursued as a whole, and that there should be the means of laying down any parts that might afterwards be required on the large scale, but I should not think of mapping the wild Highlands on the large scale.

Lieut.-Col. *R. K. Dawson*, C. B.

9 April 1856.

Lieutenant-Colonel *Henry James*, R.E., F.R.S., &c., called in; and Examined.

272. *Chairman.*] HOW long have you been the Superintendent of the Ordnance Survey of Great Britain and Ireland?—Since the 11th of August 1854.

Lieut.-Col. *Henry James*, R.E.

273. I think you were formerly the Director of the Geological Survey of Ireland?—Yes.

274. You have also been director of engineering works under the Admiralty at Portsmouth?—Yes.

275. You are at present, I think, charged with the Meteorological Observatories at the home and foreign stations of the Royal Engineers?—Yes.

276. And you are the author of a proposed system for collecting agricultural statistics, which was submitted to a Committee of the House of Lords in 1855?—Yes.

277. Will you have the kindness to give the Committee a concise account of the progress of the Ordnance survey, from its commencement to the present time?—If the Committee will permit me, I should be glad to refer to the course taken in France, when the survey of that country was first contemplated. A committee was appointed, composed of the most distinguised mathematicians, Laplace, Lagrange, and Delambre, three names that are of the highest standing in the world of science, to report upon the best method of conducting the general survey.

278. In what year was that?—1793; after that, in 1807, the Emperor Napoleon appointed Monsieur Delambre, perpetual secretary of the Institute of France (corresponding to our Royal Society), to preside over a committee composed principally of geometricians, assessors of taxes, lawyers, and men who had a practical knowledge of the purposes which the survey there should subserve; they calculated that there were a hundred millions of separate parcels of land of which they required the exact acreage and the exact value. I may observe, that I have here a collection of all the laws and instructions that have been issued with reference to the survey of France,* and that I have here also, through the kindness of the officers in charge of the French survey, specimens of the maps of France. A report was drawn up by this Committee, and the scales which were at first decided on were the $\frac{1}{5000}$, or 12 inches to a mile, $\frac{1}{2500}$, or 25 inches to a mile, and the $\frac{1}{1250}$, or 50 inches to a mile, approximately.

279. Mr. *Denison.*] Is this the survey or the publication?—It is the scale upon which the plans were to be drawn. Then by Article 219, it is said that the scale of 1 in 5,000 is too small to be generally adopted, and that the scale of 1 in 2,500 should be generally adopted. In Article 222, the scale of 1 in 1,250 is stated to be for the towns and villages; then in page 242 you will find this, that a *tableau d'assemblage* on the scales of 12-inches, 6-inches, or 3-inches was ordered to be made, but afterwards the whole were to be reduced to the one ten-thousandth scale, which is approximately the same as our six-inch scale, and then that the plans on the six-inch scale were to be reduced to form what corresponds to our one-inch map; so that in point of fact as regards their orders and our present position in Scotland, we may put ourselves in a similar position; we have got the 1 in 2,500, that is the 25-inch scale; we have the six-inch scale to which they ordered all their plans to be reduced, and we have the one-inch map which corresponds with their general map, the scale of which is about three-quarters of an inch to a mile.

280. Will you be so good as to tell us whether these different scales which you have spoken of, were the scales on which the plans were made, and which of them were published?—The plans were made upon these scales, but I do not know that they have published anything but the general map; they have published

* Recueil des Lois et Instructions sur les Contributions Directes. 1836.

Lieut.-Col. *Henry James*, R.E.

9 April 1856.

lished a variety of plans on a large scale, but they are special plans, such as that of St. Cloud, and other towns.

281. *Chairman.*] Those to which you have referred were the original instructions given for the survey of France?—Yes. In consequence of those instructions their survey has proceeded with great regularity; their general map was projected under the direction of the most able mathematicians in a proper manner; I have an index to the sheets here, and the Committee will see that they are all perfectly uniform, and on a proper geometrical projection; the purposes for which survey was intended have been fully answered, viz. a valuation of the property of the country, by means of reference to an accurate map. Now, if I contrast our proceedings with theirs, the contrast is a very melancholy one indeed.

282. Mr. *L. Davies.*] Upon what scale did they publish?—They published the one-inch map; that is their general map. They have published also several special maps on large scales, but I do not apprehend that they have published any general map on a large scale. I shall come back to that point by and bye. We sent over to the exhibition at Paris specimens of all our maps, and they did us the honour to give us two medals for them.

283. Mr. *Ellice.*] Did you tell the Committee whether there was any one uniform scale for France of any one of those scales; when was the one-inch scale published which commenced in 1793?—It is not finished yet. The first survey in Scotland or in Great Britain which was made under the auspices of the Government commenced in 1747, at the instance of Lieutenant-general Watson of the Royal Engineers, who was then in Scotland.

284. Was that the first commencement of it in Scotland?—Yes; General Roy, who was acting under General Watson, was, in point of fact, the officer who principally conducted the work; he says of this map, which was first intended only for the Highlands, but was afterwards extended to the whole main land of Scotland, that it must be considered rather as a magnificent military sketch than as an accurate map of the country, and yet that is the map which forms the basis of the maps of the Highlands at the present day?—In 1783, the French Government invited the co-operation of the English Government to connect the observatories of Greenwich and Paris by a triangulation, for the purpose of determining the difference of longitude between them. This triangulation was carried from Hounslow Heath, where the first base was measured, to Dover, extending, of course, over the intervening country. Three years afterwards Messrs. De Cassini, Mechain, and Le Gendre met General Roy at Dover; and they established in that year the connexion between the triangulation of France and of this country. There were at this time several surveys in progress, under the orders of the Master-general, which were intended only, in the first instance, for the purpose of a military map, and the triangulation which extended from Hounslow to Dover became the basis of these surveys. We have specimens of those maps here upon the six-inch scale. We have maps of Sussex and Kent on the six-inch scale, and also maps of Surrey and Hampshire. After they had completed these, and part of Essex, Suffolk, and Hertfordshire, the plans were ordered to be engraved by counties. I have the original engraving here of one of those counties as a separate county map. After this the Master-general ordered that Devonshire should be surveyed, with a part of Somerset and Cornwall, to square up the sheets, for they found it was necessary that these surveys should be brought together in sheets, and so the county engravings had to be re-engraved in sheets to form part of the general map; but the mischief did not end there; the Master-general ordered that the surveys should be engraved immediately for a one-inch map, and the triangulation not having been perfected between the south-eastern coasts and the extreme western counties, those original surveys were laid down with reference to the meridian of Greenwich, whilst the others were laid down with reference to the meridian of Butterton, in Devonshire. As the survey proceeded, the intervening space had to be filled in, as you would mend a hole in a wall, with sheets of every size. Again, as the survey proceeded, General Mudge (who had succeeded General Roy) represented that as a military map only was required, it was useless to go to the expense of a six-inch survey, with all the fields, and so they abandoned all their six-inch work, and some 20-inch work, and adopted a two-inch scale for the manuscript to produce the one-inch engraved plan. I need not inform the Committee that a vast sum of money must have been lost under such changes in the arrangements. That [*exhibiting a drawing*] will give the Committee an idea of the projection

Lieut.-Col. *Henry James*, R. E.

9 April 1856.

projection of the sheets. The northern part of England is projected with reference to the meridian of Delamere Forest; so that we have three separate projections, and an intermediate projection, as to which one can hardly tell what it refers to. From 1811 to 1816 the survey was all but stopped, on account of the war. The corps of military draughtsmen, who were principally employed upon it, were removed to the seat of war; but after the peace the survey was resumed, and in the year 1819, the survey of Scotland was commenced, and was proceeded with in Ayrshire, Kircudbrightshire, and Wigtonshire. I have the original maps here. These were on the two-inch scale intended for the one-inch map, and were executed very much in the manner in which the English survey was then proceeding. In 1824 the Committee upon the Irish survey sat, and in the same year nearly all the surveying force was transferred to Ireland; the result of which was, that the survey of Great Britain from that period may be said to have languished. In 1827 the survey of Scotland was stopped altogether. In the Report of 1824 the Committee referred very specially to the instructions which had been issued by the French Government; they quoted the instance of France and Bavaria, but, apparently by the result, simply to avoid the conclusion at which the French had arrived, the gentlemen composing that Committee said that a survey by fields was not required, and that all that was necessary was a survey by townlands. We proceeded under the instructions resulting from that recommendation, and surveyed about one-fourth of Ireland, when the valuators commenced their work; and they soon found, not that there was any inaccuracy in the maps, but that they did not contain sufficient data to enable them to value the land. We after this received what might be called "partial instructions;" they were afraid to face the question, apparently, and it was only until we had got down to the centre of Ireland that we received instructions to survey every field. I adduce these instances to show the extreme importance of proceeding, in the first instance, for a perfect survey. We are now engaged, and have been for a considerable time, in putting in the fields, to make the survey of the North of Ireland complete; and this is costing the country an immensity of money, and an immense loss of time, all of which would have been saved had the survey been made perfect in the first instance. But there is another important matter: they had a Boundary department; a department whose special duty it was to find out the boundaries of every townland, and they made a sort of rough preliminary survey, the expense of which was very great. I think that 137,000 *l.* has been expended by the Boundary department alone; that was done, not by the Ordnance, but by Mr. Griffiths, the Chief Boundary Surveyor. I think the Committee will see especially those who have a professional knowledge of the subject, that if our survey had been made perfect on a proper scale with every field in it, no boundary sketch need have been made, because we could have traced the boundaries by the fences which are the boundaries of the townlands, and in that way a great deal of money would have been saved. The field survey of Ireland was completed in 1840, the plans were completed in 1842, and the engraving of the six-inch map in 1844. In 1840, the surveys of England and of Scotland were resumed; but because the six-inch plans of Ireland had been found so valuable, it was presumed that the six-inch scale was equally applicable to England, and therefore the survey of England and Scotland was ordered to be on the six-inch scale. Now here a great mistake was made. The condition of England, and the condition of Scotland, as contrasted with that of Ireland, is as different as possible. In Ireland the townland is a civil division of the country, but it is also a division of property in 99 cases out of 100; so that if any gentleman in Ireland speaks of his property, he says he has so many townlands*; it is well understood what that means; we were, therefore, not only surveying the parishes, and baronies, and counties, but separate properties also; and, as Colonel Dawson explained just now, the areas, having been obtained from the measurements taken on the ground, and not depending on the scale on which the map had been laid down, were given with all the accuracy of the scale of nature. But if we contrast the state of England with that of Ireland, see how different the position is. Our parishes are not divided into townlands; and although we have townships in England they are not property divisions, and there

* There are 60,760 townlands in Ireland, the areas of which are printed on the maps, and 2,470 parishes.

Lieut.-Col. *Henry James*, R. E.

9 April 1856.

there is no such thing even as a township in Scotland; and, more than that, the parishes in Scotland are so large, that if we were to give the six-inch map with the few areas, so to speak, absolutely determined by the Government upon them, they would be very few indeed. I think there are only a thousand parishes altogether in Scotland. But we proceeded with the six-inch survey, and we had finished Wigtonshire, Kirkcudbrightshire, Edinburgh, and part of Haddington, and the Isle of Lewis, when the Committee of 1851 was appointed. But I should observe that, in 1849, the subject was brought under the notice,—I will not say under the full consideration, but it was brought under the notice of, perhaps, the most influential Committee that could well have been constituted from the House of Commons,—I mean the one of which Lord Seymour was the chairman, and of which Mr. Hume, Mr. Walters, Sir William Molesworth, Sir James Graham, Mr. Sidney Herbert, Mr. Cobden, Mr. Vernon Smith, and others, were members; and which had to report upon the Ordnance and Army expenditure; they had before them the entire estimate for the survey of Scotland, and the only recommendation they made was, that the surveys of the towns should take precedence of the surveys of the rural districts. You may therefore consider the Report of that Committee as not objecting to anything we were then proceeding with; but, in 1851, the Committee of which Lord Elcho was the chairman sat, and that Committee recommended the abandonment of the six-inch scale, and the abandonment of the system of contours, and that the survey should be for a one-inch map only. I fancy I understand the grounds upon which that report was founded; there was a want of a clear understanding as to what was required, whether a property map, or a geographical map, which, I think, has led to a great deal of confusion upon the subject, because whilst one was speaking of the size of the six-inch map, and saying that it was an absurd thing for a person to be travelling about in his carriage with it, the person who recommended the six-inch map never dreamt of using it as a travelling map at all, it being always understood that the one-inch map was to be reduced from it; but now, as I conceive, the question comes under a different aspect; the question is, whether, a property map being required, this scale of six inches is not too small, and whether it ought not to be on some such scale as the one that has been ordered? this, I apprehend, is the real point.

285. Mr. *L. Davies.*] By whom was the larger map ordered?—It was ordered on the 15th July 1854.

286. Was it ordered by the Government?—Yes, by a Treasury Minute of that date.

287. Mr. *Denison.*] I do not think that before the Committee of 1851, it was distinctly understood or intimated that a one-inch map was to be established equally with a six-inch map, and you know it was not done in Ireland; you know that in Ireland the six-inch map was the only map published for the country; requests had been made for a one-inch map, but the only map published was the six-inch map; I believe I am correct in that, am I not?—No; so far from the one-inch map not having been contemplated for Ireland, one-half of Ireland was actually sketched for the one-inch map, between the years 1830 and 1838, by Colonel Dawson and his assistants.

288. Mr. *Stephenson.*] Suppose in 1845 an engineer had been called on to go into Ireland to lay out a line of railway, would he not have been in a predicament, if he used the plan you contemplated, of having an enormous amount of paper to carry with him?—This one-inch work was not engraved; it was in manuscript only.

289. But the six-inch plan was?—Yes.

290. Mr. *Denison.*] Has there been a one-inch map published in Ireland?—It has been in part published; we have the impressions here.

291. *Chairman.*] You are now publishing a one-inch map of Ireland?—Yes, and we are continuing that of England, and publishing that of Scotland.

292. Mr. *Ellice.*] I do not understand you to say that when the Committee of 1851 was sitting, the one-inch map was actually publishing, being the result of the surveys that had taken place in Scotland?—No; our instructions were, to complete the map of England on the one-inch scale, and it was always understood that we should complete Scotland on the same scale; but the engraving of it was not begun till 1851.

293. Up to the present moment, there is no inch map of the Island of Lewis published, is there?—Yes; it is in the room.

294. How

294. How long has that map been published?—When I say it is published, it is engraved in outline; the hills are not engraved upon it.

295. Mr. *L. Davies.*] You are speaking of the Government instructions?—I have brought here impressions or sheets of the English, Irish, and Scotch one-inch map, in order that the Committee may see the exact state of the engraving at the present time. I was desirous to bring down the historical sketch to the present moment, and I have only to add, that this scale of $\frac{1}{2500}$ was ordered for Ayrshire and Dumfriesshire by name; but the order goes on, "and the other districts in progress:" it was an oversight on the part of those who fancied that Ayrshire and Dumfriesshire only were to be done on the 25-inch scale.

296. To what order do you now refer?—To the order of the 15th July 1854.

297. Issued by whom?—By the Treasury.

298. *Chairman.*] I understand the orders under which you are now acting are contained in the Treasury Minutes dated 15th July 1854 and 18th May 1855? Yes; but I have not explained to the Committee what that last Minute is; that the scale of $\frac{1}{2500}$ should be confined to the cultivated districts, and that the uncultivated districts should be drawn on the scale of six inches to a mile.

299. Mr. *Ellice.*] That was the last Minute?—Yes.

300. But the Minute of 1854 has reference to the two counties?—And the other districts in progress. The Minute is: "Under these circumstances, my Lords are of opinion that the surveys of Ayrshire and Dumfriesshire should be laid down and drawn on paper to the scale recommended by the Committee, *i. e.* $\frac{1}{2500}$ of the linear measurement of the ground; and that upon the margin of every separate sheet of the map, in addition to the statement of the proportion which the linear measurement of the map bears to reality, there should be drawn scales expressing English feet, yards, chains, and miles, so as to provide for a ready comparison with other maps." Then in the next paragraph they say: "My Lords are also of opinion, that until a final determination shall be arrived at as to the scale upon which the Ordnance survey shall be conducted and engraved, the course which has been authorised in reference to Ayrshire and Dumfriesshire should be applied to the survey of other districts." On the 18th of May 1855, this large scale was ordered to be confined to the cultivated districts, and the six-inch scale to the uncultivated. The only other order in addition to that, has been given in consequence of a representation made by myself, that if the Committee, which it was understood was to sit upon this subject this Session, should decide upon continuing to engrave the six-inch or any other large scale map upon which the employment of a large number of engravers would be necessary, it was of the utmost importance that we should find employment for the engravers (a splendidly-trained body of men) which we now have. I consequently suggested that the large plans of the county of Linlithgowshire should be reduced and engraved on the six-inch scale, and be again reduced to the one-inch scale; by which means we should not only keep together the body of engravers that we have, but the Committee would have before them the same district of country on three scales, and would consequently have the most ample data for arriving at a safe conclusion upon this question.

301. Has the whole of Linlithgowshire been done upon that scale?—Yes.

302. *Chairman.*] Are those the orders upon which the survey is at present proceeding?—Yes; but the order for reducing to the six-inch scale is confined to Linlithgowshire.

303. Will you allow me to call your attention to another part of the Treasury Minute, dated 15th July 1854, which states, that "previously, however, to sanctioning the adoption of the large scale as a general measure, my Lords deem it right to ascertain by actual experiment the increased cost of such surveys and maps, in comparison with those drawn to the scale of six inches to a mile; and they therefore desire, that in the further progress of the survey of rural districts, trial be made of the system of piecework within the department, and of that of independent contracts with other surveyors supervised and approved by the officers of the survey, and that an accurate account be kept, under separate heads, of the cost of the work, according to each of those processes, as well as according to that of daily pay, hitherto in practice; and that a report be made to this Board, at the earliest practicable date, of the expense of the survey on the large

Lieut.-Col. *Henry James*, R. E.

9 April 1856.

scale according to each of the above processes, as compared with that of the six-inch scale;" what has been the result of the experiments as regards the system of independent contracts, or a system of piecework, in the department, as compared with the system of payment by daily wages?—The result of the experiment, which was reported to the Treasury on the 4th of February 1856, was as follows: "That the cost upon the system of piecework, upon which we are now proceeding, was 1*s.*; upon the system of daily pay it was 13*d.*, and upon the system of contract it was also about 1*s.* I am afraid it will be rather more before we have done with it. I have made a report upon that subject to the Treasury. I do not know whether the Committee will wish me to read it. The result is, I consider the system of piecework can be very advantageously introduced into the department. I have tried it in every district and every class of work; and from the circumstance of the men having the stimulus of earning additional pay, it has led to increased progress.

304. Mr. *L. Davies.*] What do you mean by piecework?—Supposing a man has to draw one of those sheets, which contains 960 acres, we have a price for drawing per acre. We, in point of fact, have a table which contains 25 prices, in this way: On the top of the table it is divided into "very open work," "open work," "medium work," "close work," and "very close work." Then down the vertical margin we have "surveying," "plotting," "drawing," and "computing" the areas of these several classes of work. We have now adjusted the prices, so that the men can earn a very reasonable profit by exertion, and the ultimate effect must be that not only we shall get the survey done quicker, but the great dead-weight of the establishment and of the offices in different parts of the country will cease earlier, and so the effect will be to cheapen eventually the cost of the survey; but the system of independent contracts, although I imagined I had taken every possible precaution to insure accuracy, has nevertheless failed. I deemed it to be of the utmost importance that whatever survey was made by contract, it should form an integral portion of the general survey, and should therefore be based upon the general triangulation. We therefore supplied diagrams to the contractors; and, more than that, we offered, if any one of them chose to pay for it, to give them sheets with the marginal lines and scales drawn upon them, and with the trigonometrical points laid down upon them also. There is an Act of Parliament which empowers us to determine the boundaries of parishes; and therefore we, and not persons in the position of contractors, could alone authoritatively determine them. I therefore deemed it of importance that we should perambulate the boundaries and make a boundary sketch, which would be a guide for the contractors in making their surveys. I deemed it also of importance that the levels as those in one part of the country must be in relation to the others, should be supplied by us, as they all have reference to one datum plane; but with all this aid, the system failed.

305. *Chairman.*] Will you state to the Committee what progress has been actually made in the survey of Scotland, and upon what scales the different counties have been drawn and published?—I prepared the diagrams, which I have here, and they represent pictorially the exact progress of the survey in the several counties; but I can enumerate them: the counties of Wigtonshire, Kirkcudbrightshire, Edinburgh, Haddington, Fife and Kinross, Linlithgow and the Isle of Lewis, are all engraved upon the six-inch scale; Ayrshire, Dumfriesshire, Renfrewshire, Linlithgowshire, Peebles, and half of Berwick, are surveyed, and lines plotted, and in part published, upon the $\frac{1}{2500}$ scale.

306. That is the 25-inch scale?—Yes; all these several counties, as they are now drawn, are, upon the orders I have given, reduced immediately to the one-inch scale, and engraved; and impressions are here which will show the state of the plates at the present time, that is, up to within a few days ago.

307. What progress has been made in the surveys of the large towns of Scotland?—The surveys of every town in the before-named counties, the inhabitants of which are above 4,000 in number, have already been engraved and published; some of them are now hung on the wall, for the inspection of the Committee.

308. Mr. *Ellice.*] Does that apply to all the towns?—All the towns in the counties I have named. In addition to that, some smaller towns, being county towns (as Wigton, for instance), which do not contain 4,000 inhabitants, have been engraved also. Haddington has been done, for the same reason; and it would have been better if Dunbar had been engraved.

309. Have

309. Have you named all the towns?—No.

310. *Chairman.*] I asked you what progress had been made in the surveys of the large towns?—I have a list here: Berwick-upon-Tweed, Cupar, Dalkeith, Dumfries, Dunfermline, Edinburgh, Haddington, Kirkcudbright, Kirkaldy, Musselburgh, St. Andrew's, Stranraer, and Wigton.

311. What progress has been made with the general map on the scale of one inch to a mile?—The progress is equal, as far as the outline goes, to that of the larger scale plans, and we are proceeding with the sketching of the hills, based upon the contours.

312. Mr. *Ellice.*] To what extent are the one-inch maps available now for the public?—We have only two that are actually finished in outline, for the public.

313. Only two that are ready for sale?—That is all.

314. They are for sale now?—Yes.

315. *Chairman.*] But there are a number of them in progress?—A great number; the impressions are here; every part that has been drawn on the large scale is already reduced to the one-inch scale, and is in the course of engraving; it has been impossible for me to make up the entire arrear, but as far as the hands of men can do it, it has been done.

316. What special objects are the plans on the 25-inch scale intended to subserve?—They have been enumerated on several occasions: for my own part, I consider with Mr. Warbuton, whose letter is in the printed correspondence, that the single object of the registration of property would justify the entire extra expenditure of making maps of the cultivated districts upon the large scale.

317. Your views are in concurrence with those of the witnesses who have been examined on that subject, are they not?—Not upon all points.

318. But upon that subject?—Yes.

319. Upon the value of the 25-inch scale?—Yes.

320. Mr. *L. Davies.*] It is applicable, in your opinion, to all the purposes they have stated, and it is also applicable to the purposes of registration?—Yes; and if I had any doubt upon that point, that doubt would give way before the evidence which I thought it my especial duty to collect upon the subject. Knowing the extreme difficulty of dealing with questions in an abstract point of view, I sent down to the assessors of taxes in Scotland one of the plans, with tables of reference, applicable to all those counties of which we had any plans drawn, and, with the permission of the Committee, I will either put in the answers or refer to them shortly. This is from Fifeshire; it is dated 5th March 1856; the writer is Mr. Patrick, one of the assessors; he says, "With regard to the larger scale, and area sheets sent, I think there cannot be two opinions, that to all persons having to do with the valuation of properties, maps on the scale referred to would be of immense service; they certainly would be so to me." The next is a letter from Mr. Crosbie, of Castle Douglas, "The map on the scale of 25 inches to the mile, and area sheets similar to the specimens sent me, would be of immense advantage in carrying out the provisions of the Valuation Act. Indeed I am of opinion this Act cannot be efficiently carried out without them, and I think every county ought to possess maps, and area sheets of its whole extent, for its own use." Then comes a letter from a gentleman at Haddington, Mr. Crawford: "I beg to inform you, that the maps already published (on the six-inch scale) have been of considerable service to me in my capacity as assessor, but, that those on a larger scale, such as were forwarded to me on the 27th ultimo (on the 25-inch scale), would be infinitely more useful."

321. Mr. *Ellice.*] Is the Haddington map on the 25-inch scale?—No; I sent them a parish, like that of Abercorn on the large scale with the reference sheet, and said, "Would this enable you to carry out the provisions of the Act?"

322. To what did Mr. Patrick's letter refer; did it refer to the six-inch map which he had already?—No; it referred to the 25-inch map, or rather to both.

323. *Chairman.*] I think you are aware that a re-valuation of the whole of Scotland is now going on under an Act of Parliament, passed, I think, last year?—Yes.

324. Have you any observations to make upon that subject?—My impression is, and the impression has been confirmed by reference to people to whom I have written, that they cannot properly carry that Act into operation without a survey, upon which all the properties can be shown.

325. Mr. *Dunlop.*] Did you send the circular to all the valuators in the country?—

Lieut.-Col. *Henry James*, R. E.

9 April 1856.

country?—No; I only sent them to the assessors in those counties of which we have published maps on the six-inch scale.

326. And they all agree in opinion?—Yes.

327. *Chairman.*] I believe that in your letter to the Treasury, dated the 7th of May 1855, you recommended that the plans of the cultivated districts should be reduced to the scale of six inches to the mile; will you have the kindness to repeat your arguments in support of that view?—The view which I expressed upon that occasion, and which I still entertain, is this, that inasmuch as I conceive that maps of the Highlands upon the six-inch scale are sufficient for property purposes, sufficient for the hydrographical survey, and sufficient also for the geological survey, but no more than absolutely necessary for those several purposes, and as we had equivalent to eight counties already engraved on the six-inch scale in the Lowlands, the practical course now to be pursued, without reference to what sort of scale we should have liked, had we done nothing, was to reduce these large 25-inch scales also to the six-inch, and so to make every county complete on one uniform scale. I pointed out this in a letter to Lord Panmure, who was a Member of the former Committee, as Mr. Fox Maule, in 1851, and his Lordship forwarded my letter to the Treasury, stating his entire concurrence in the views I then expressed. I do not believe that any one ever contemplated (unless, indeed, Colonel Dawson has done so) extending the scale of 25 inches to the mile to the Highlands, and therefore there must be a broken scale, unless the 25-inch plans are reduced to the six-inch scale. Every one who knows mountain districts, knows very well that you would have properties partly upon the large and partly upon the smaller scale; part of a farm would be on one scale, and part on another; and, in fact, you would not have one property or one parish so situated on a uniform scale; whilst the simple reduction of the large scale to the six-inch, which is a mere mechanical operation, would perfect the survey for every possible purpose. I have considered the subject since, and I have tested it practically. I have here the plans of a parish in Ayrshire, in which the country is partly cultivated and partly uncultivated, and I have shown how, from the circumstance of the large plans occupying exactly the sixteenth portion of the area of the plans upon the six-inch scale, you are able to extend or check the area over which these large plans are to be drawn, with perfect ease, and without producing any confusion whatever, because we make a double reference; we consider the six-inch survey, in this view of the subject, as the survey of the county, because the whole would be upon that scale; but the cultivated portions being on a larger scale than the uncultivated, if you were not to reduce the plans to a uniform scale, you would have the greatest confusion possible. We have already done a great deal upon the six-inch scale; and no one, I suppose, would contend that a larger scale than six inches is required for the Highlands. I am clear in my own mind that the course which I have described should be adopted, and I have recommended it to the Government.

328. I understand you to say, that what you would suggest is, that the 25-inch survey should be made of the populous and cultivated districts?—Yes.

329. Do you recommend a six-inch survey of the Highland districts, as contrasted with the populous districts?—Yes.

330. And do you recommend, also, that a one-inch plan should be published of the whole country, founded upon those surveys?—Yes.

331. Mr. *L. Davies.*] What would you propose with regard to the counties where the six-inch survey has already been made?—No re-survey is necessary; we could plot the same on a large scale, and then the whole survey of the country would be perfect and uniform.

332. On the uniform large scale?—Yes.

333. *Chairman.*] I understand you to say, that having surveyed upon the large scale, the reduction from the large scale to a smaller scale is a comparatively easy operation?—A mere mechanical operation.

334. I wish to ask whether if a survey is conducted on the small scale, say on a one-inch scale, it would be possible to increase that survey to a larger scale by a simple operation?—Certainly not.

335. In your opinion it would be impossible to increase it, without having a fresh survey?—Yes.

336. Mr. *Denison.*] Do I understand you to say, that if you had a six-inch survey you would be able to increase that?—The measurements taken upon the ground

ground are taken in sufficient detail to enable us to lay them down on the larger scale.

337. Have you in your possession drawings which would enable you to lay it down on a larger scale, without returning to the ground, and incurring a larger expense?—Yes; that is, we have the measurements which were taken on the ground, in books.

338. Mr. *Ellice.*] How is that consistent with the evidence which was given before us yesterday, to the effect that the larger scale was the only one on which the precise area can be determined?—We are going to make the large scale.

339. But you are going to take the small scale as the basis?—No; I am going to take the scale of nature; we redraw it from the original measurements taken in the field.

340. Mr. *L. Davies.*] Do you mean that when you took the measurement for the six-inch survey, your survey was of such a character that you could at once execute the 25-inch map?—Yes; we might have to take the manuscript plan on the ground, and have a field examination, but no re-measurement would be necessary.

341. Mr. *Denison.*] But you must return to the ground?—Not to take any measurements, but the eye must pass over the plans.

342. Mr. *Ellice.*] How are we to reconcile that with the evidence which, unless I misunderstood it, was given by Sir Charles Trevelyan, that upon the six-inch scale it was impossible to determine with accuracy the area, and that therefore recourse must be had to the larger scale, as the only means of enabling you to determine the area?—Sir Charles Trevelyan was quite right in that; you must always bear in mind that the areas are as the squares of the linear measures; and where you have maps on a small scale you cannot depend upon them for areas.

343. *Chairman.*] It would require a larger scale than six inches for an accurate survey of the whole country?—The difference between this country and Ireland is this: you want to have the area of the properties; in Ireland we have given the areas of the properties, by giving the areas of the townlands, and those areas are obtained from measurements, and therefore from the scale of nature. You want the same thing for this country for the purpose of valuation and registration of property; you want not only the exact acreage of each enclosure, but you want to have a plan on which the reference numbers may be put where the enclosures are small; therefore you must have plans on a scale larger than six inches to a mile, so that when you wish to transfer land by sale, mortgage, or by lease, by having the exact acreage of every field, you are able to give the exact acreage of every property, and that on a document with the Queen's impress on the top of the sheet.

344. Mr. *Stephenson.*] In fact, to ascertain the area, you do not make use of a map at all; you refer back to your field-book, and estimate the area from those dimensions; therefore, whether it is a six-inch or a 25-inch map, you do not make use of the real map; you go back to the field-book?—No, you mistake me; I say that in Ireland, where we know what the area of the property is, and know the townland boundary, we can and do register, as we call it; that is, obtain the acreage from the field measurement; but in this country, and in Scotland, we are not supposed to know what the boundaries of the properties are, and we must take the areas from the maps.

345. Then it would be equally impossible to ascertain the area, whether it was a 25 or a six-inch map?—No; there is a book of reference, containing the number and acreage of every field; the consequence is, that if you merely surround by a pencil line on the 25-inch plan, any property to which any document of sale or mortgage refers, the acreage is given directly, and the boundary of the property.

346. Mr. *Ellice.*] I understand, from the evidence given yesterday, that upon that large map you can by actual measurement determine the area of any precise space?—Certainly; the scale is one square inch to one acre.*

347. Do I understand you to say that you can from a smaller map make an accurate large map?—No; you cannot do so.

348. Mr.

* The square of 1·0018 inch is equal to one acre.

Lieut.-Col. *Henry James*, R.E.

9 April 1856.

348. Mr. *L. Davies.*] Suppose that you had the six-inch map, and that you had what is termed the book of reference, with the quantity shown in it, still the six-inch map will not, from its necessarily crowded state, give you the exact delineation which you would have in the large one?—No; but I should observe, that I attach the utmost importance to your having that six-inch scale, not only for the reasons which I have already mentioned, but for other important reasons: whilst we require the large scale, from which to obtain the correct areas, we can put into the six-inch scale the reference numbers, in a great majority of cases, for many purposes, as for agricultural statistics, for example; so that there are the actual areas of the large scale referred to on the small-scale maps.

349. Mr. *Vernon.*] Having once made the actual survey, you could make a map at any scale you please?—Yes.

350. From a large map you can reduce with accuracy, but from a small map you cannot enlarge with accuracy?—Yes.

351. On a small map you cannot calculate contents, whereas upon the large map of 25 inches, you can calculate contents with accuracy?—Yes; Mr. Stephenson was not present when, previous to the sitting of the Committee, I explained the arrangements that we made to meet what is called the itinerary measure, and the acreage for this large scale; and inasmuch as what I then said was not put in evidence, it would be perhaps desirable that I should say a few words upon that subject now. Each sheet is made exactly one mile and a half wide and one mile deep, and consequently each sheet contains 960 acres, and exactly contains the 16th part of the area of one of the six-inch sheets; the six-inch sheets being six miles wide by four miles deep.

352. *Chairman.*] Will you have the kindness to state the amount of the estimate for all Scotland, according to the arrangement proposed by you?—It is printed with the Minute of the 18th May 1855, in page 13. Perhaps I may be permitted to mention with reference to this question of the reduction to the six-inch scale, a remarkable circumstance as regards the city of London; although we have furnished an engraved map on a five-feet scale, and although they have a map on a one-foot scale, they have found those scales so extremely inconvenient that I have just received an application, dated the 25th March 1856, to engrave a map on the six-inch scale of London.

353. Mr. *Ellice.*] In preference to what other scale?—They have all the others; they have 10 feet, five feet, and one foot, and one inch to the mile; but still they want a six-inch scale map.

354. Mr. *Stephenson.*] Who made that application?—I do not know any gentleman connected with the department, but here (*producing a Letter*) is the official application; it is from the new Board of Works. I have several other letters here, one an important letter from the hydrographer of the navy, pointing out the immense advantage of the six-inch scale for the hydrographical surveys, and stating that, from the circumstance of their having our six-inch surveys in Scotland, Ireland, and England, wherever their operations extend, they have been saved in many instances a full half of the cost of the hydrographical survey, and in no cases less than two-fifths.

355. Mr. *L. Davies.*] Was that from having the six-inch maps?—Yes. I may mention also that I have several letters here from distinguished geologists, and among others, from the late Sir Henry De la Beche, all concurring in this: that for geological purposes they require the six-inch map, and (to use the words of Professor Jukes) "that the one-inch scale is a mere rubbish makeshift in comparison."

356. *Chairman.*] What is the amount of the estimate for all Scotland, according to the arrangement proposed by you?—The estimate which is here inserted is printed in page 13 of the papers relating to the Ordnance survey. This estimate was based on the assumption, that we could make a survey on the large scale at 12*d.* an acre. We have now had a year-and-a-half's experience; we have had the accounts most accurately kept, and we have found the cost to be a fraction less than 1*s.* an acre; but inasmuch as there is some uncertainty, not only as to the acreage of the whole of Scotland, but also as to the amount that will have to be done upon the one scale and the other, I have not thought it proper to alter the estimate. I leave it as it stood originally, but with the full conviction that it cannot possibly be exceeded, because we have a margin which my experience tells me will be sufficient; the estimate is 917,500 *l.* for the whole of Scotland, supposing

supposing nothing had been done; that is, for the 25-inches for the cultivated districts, reduced to the six-inch scale, and the six-inch for the uncultivated.

357. I understand that that 917,500 *l.* includes the expense of the whole Ordnance survey of Scotland; Scotland being surveyed upon the 25-inch and the six-inch, and the map being published upon the one-inch?—That is the estimate, supposing nothing had been done; but we have done one-fourth, therefore you must deduct one-fourth from that amount as the actual sum now required.

358. Mr. *Ellice.*] The 917,500 *l.* would be, in fact, the whole cost?—Yes.

359. Including the publication of the 25-inch map?—It includes everything.

360. The publication of the 25-inch and the one-inch?—Yes.

361. But not the 25-inch for the Highlands?—No; I never contemplated drawing the Highlands on the 25-inch scale; that estimate, in Paper No. 4, I drew up at the request of Lord Palmerston, immediately after the discussion which took place in the House of Commons last year.

362. I asked you whether this estimate included the publication of the 25-inch as well as the one-inch?—Yes.

363. It does not say so here?—No, for a good reason, that the cost of the publication of it is scarcely anything; I should be glad to explain that to the Committee.

364. *Chairman.*] Will you look at the bottom of that page (*handing a Parliamentary Paper to the Witness*), and tell us what the actual estimate is?—I gave three estimates.

365. To Lord Palmerston?—Yes; these are the estimates which I furnished to Lord Palmerston, on the assumption that Scotland contained 30,000 square miles: 1st. For the one-inch map only 250,000 *l.*; 2d. For the six-inch map and the one-inch map, that would be 817,000 *l.*; 3d. For the 25 inches for the cultivated districts, and six inches for the uncultivated districts, and for the one-inch map, 917,000 *l.*

366. Do I understand that you adhere to that estimate as it was then put in?—Certainly.

367. Will you have the kindness to explain to the Committee what that estimate of 917,000 *l.* includes?—It includes the publication of the 25-inch plan, either by the anastatic or by the lithographic or zincographic process, whichever might be found most convenient. I have brought here specimens of plans printed by the three processes, and in addition to that I have brought impressions done by the anastatic process from the lithographic copies.

368. Will you have the kindness to explain to the Committee what the anastatic process is?—The process consists in this: a tracing from the original manuscript plan is simply damped and turned over on a sheet of zinc, and then a sponge containing very dilute nitric acid is passed rapidly over the back of it; the effect of that is to eat or corrode, to a certain extent, the whole of the zinc except those parts where it is protected by the oily nature of the ink; it has a double action, so to speak, for the ink itself receives a different character from the action of the nitric acid. In that simple manner you are able to obtain prints from the zinc plate immediately afterwards.

369. The *Lord Advocate.*] A great number in a very short time?—Yes; it is a process by which the multiplication of copies of plates could be carried to an unlimited extent in the shortest time; for from any one impression you are always able to make another plate, and so to set to work another plate, and from each impression so produced you could put in action so many more plates; so that as a mode of publication nothing can exceed the rapidity of it.

370. Thousands of copies might be produced in a day, I suppose?—Millions.

371. *Chairman.*] Will you have the kindness to state to the Committee whether the estimate of the 917,000 *l.* includes contouring, and every other expense connected with the survey?—Yes; I should be glad to refer to this Report of Lord Ellesmere's Commission, because from the account Colonel Dawson gave just now, it is very clear we have taken a very different view of the recommendations of that Commission. I wish to refer the Committee to page 366 of the Blue Book of 1854, and to read paragraphs four, five, and six. Paragraph four is, "That the levels above described having been provided, contour lines to a certain extent would be an useful addition to a map on the six-inch scale, and well worthy an outlay of 5 *s.* per lineal mile; this being the cost of contouring, as estimated by Captain Gossett, on the assumption that the levels above mentioned have been

Lieut.-Col. *Henry James*, R. E.

9 April 1856.

been previously obtained and recorded; these contour lines should be instrumentally traced with accuracy, and the system of interpolating contour lines should be abandoned." Paragraph five is, "That contour lines selected from those obtained for the large surveys (if of a different colour) would be an useful addition on the one-inch map; but on maps of a larger scale, of 24 or 26 inches, they would be inexpedient;" we have not placed them on any large-scale map. Then the sixth paragraph is:—" In those districts to which the large scale of 24 or 26 inches to the mile is already applied, it would be most desirable that a reduction should be made and published on the six-inch or some intermediate scale between the large plans and the one-inch map." Nothing could be more express than that recommendation, that if there is a six-inch plan it should be contoured. The question as to the manner in which the hills were to be drawn, was referred to Sir John Burgoyne, who says in page 368: " I think I can with great confidence state, that the recommendation had in view hill-sketching on the ground, and hill-drawing on artistic principles, to which they proposed should be added selected contours from those that might be authorised for the larger surveys."

372. Mr. *Denison.*] Why would not a contour on the 25-inch map be useful?—That map of Aldershot (*referring to a Map suspended in the room*) is contoured on a large scale; but I think you cannot bring the area under your eye at one time, and therefore it has not the advantage in that respect that a map on the six-inch scale or a smaller one has.

373. *Chairman.*] You have recommended that the system of contouring should be continued?—Certainly; I recommend that it should be continued, and I have no hesitation whatever in saying, that the system which has been recommended as a substitute for it, as shown upon the maps which are here, would not answer the same end; and I believe that if the altitudes were put on according to that system, they would be more expensive than the system of contouring, and would produce a result not worth one-tenth of what the contours are worth; but the maps are here, and it is a question which gentlemen of science, such as Mr. Stephenson and others, can determine.

374. Will you state to the Committee the advantages of recording the levels by means of contours, instead of by the ordinary method?—By means of contours you have the most perfect and accurate basis for sketching that can possibly be; you have at once brought to your eye the areas of the country at different altitudes; you can see, for example, to what altitude cultivation can be carried, and the quantity of ground above that altitude; it is important also in a scientific point of view, and I can now speak with perfect confidence upon this point, because we have recently had to compute the attraction of the Pentland Hills, and having the contoured plan before us, and knowing the specific gravity of the rock, we were able to follow out an important physical question which, without such data, it would have been utterly impossible for us to have done. As a geologist, I speak with confidence as to its immense importance in investigating many interesting points in that science; for instance, where we find, as we do on the side of Snowdon, and other places, the fossil remains of the testacea of other days, we see at what altitudes at an ancient period the sea stood, and we can see the exact configuration of the land and water in those days. In Ireland and Scotland we can, in many places, actually trace out the sand banks of those ancient seas, and explain, in point of fact, the geology of the country as regards all its superficial deposits. These are purely scientific questions, but the practical importance of them with reference to all engineering purposes must be obvious, as we not only have the plan, but the relief also of the ground.

375. The *Lord Advocate.*] Will you explain to us, who are ignorant of the matter, what the process of contouring is?—The datum level of England, I mean for the English survey, is the mean-tide level at Liverpool, and from that we have run lines of levels going round even to the very north of Scotland, and coming round again to the same points; that we call our primary datum lines of levels. I may mention incidentally the singular fact, that the plane of the mean tides in Ireland is raised as an inclined plane three feet higher on the north-west than on the south-east. Having these primary lines of level established, if we wish to run a contour, suppose at 50 feet, or any other altitude, we merely go up the side of any hill till we reach the altitude of 50, 100, or 200 feet,

feet, and then the level is put up, and the leveller directs a labourer who goes on with some pickets, and traces the horizontal line on the ground.

376. How do you mark that on the plan?—By reference to objects on the plan.

377. Those are the contour lines?—Yes; the contour line is a continuous line of levels, so that you have levels in every direction, and, as will be seen, having a map of that kind, it is perfectly immaterial in what direction you want to run a section. It furnishes the data of a model. The little model which is now before the Committee is made from contours.

378. *Chairman.*] Will the contours alone enable you to dispense with the necessity of having the features of the ground sketched?—No. I know that some gentlemen and some of my brother officers were under that impression for some time. I have a drawing here made from the contours of Yorkshire in a district, the geology of which I perfectly well know, and the features of which are perfectly stamped in my memory; the moment I saw it I pronounced it to be insufficient, and I sent an officer to sketch the piece of ground to which I specially referred, and I have brought the sketch here. I have submitted it to Professor Phillips, a distinguished geologist, who is well acquainted with every inch of the ground, and I think I could refer to his words; they are to the effect that it is the most beautiful thing he has ever seen; but it was very different from the drawing from the contours. We formerly reduced the six-inch to the two-inch scale, and sketched upon the reduced map; but it appeared to me that that was an expensive and unnecessary process; having the six-inch scale, the simplest plan was to go upon the ground with that engraving in your hand, and sketch the ground upon it, and from that to make a drawing with the hills upon them upon the one-inch map; but we are now advancing, I am happy to say, by a process (of the success of which I am perfectly confident), which will enable us from these six-inch plans to reduce to the one-inch scale, with the hills beautifully drawn on the reduced copy. I have specimens here, and shall be glad if the Committee would look at them. These reduced drawings have been made by photography.

379. Would this photographic process, as applied to the survey, considerably economise the reduction of one scale to another?—Yes, and it is extremely valuable for the purpose of reducing the drawing of the ground.

380. Mr. *L. Davies.*] Does it give you the dip of the ground?—The contours and levels give that. (*Some plans are exhibited by the Witness, and explained to the Committee*).

381. *Chairman.*] Do you think that the introduction of the photographic process will be of great advantage hereafter, in enabling you to reduce plans which have been made on a large scale to a smaller scale?—Certainly.

382. The *Lord Advocate.*] Could you, by the magnifier, again reproduce your six-inch scale from the smaller one?—I fear not. I am speaking of coming down from one scale accurately to another scale.

383. *Chairman.*] Is it not the fact that if by any chance there were an error upon the small scale, if you magnified that small scale you would magnify the error to a very serious extent?—Of course. I should observe, also, that we have been photographing not only by daylight, but we have been trying artificial lights, and we have now no doubt whatever of being able to print by the electric light. We go further than that; Mr. Fox Talbot has no doubt whatever of being able to engrave by photography, so that the processes that are now in the course of experiment lead me to infer that the cost of producing reduced maps will be very much diminished in future years; but I have still made my estimate upon the supposition that we have no mechanical assistance of this kind.

384. Mr. *Denison.*] Have you made much progress in fixing photography?—These experiments have not been in hand long enough to enable us to judge of the durability of the drawings, but I think the Committee must see that to have a drawing brought down for the engraver directly from the original drawing taken upon the ground, thus avoiding all possible misinterpretation on the part of, it may be, a very good draughtsman, but probably one who has never seen the ground at all, must be a great advantage.

385. I believe that, during the time you have been occupied on the survey, you have introduced many other experiments very successfully, which have tended to economise the original expense of the survey?—Yes.

386. When you said you thought it would diminish the expense of the survey,

Lieut.-Col. *Henry James*, R. E.

9 April 1856.

did you mean that you think it would be possible to apply photography to maps that are to be published and sold?—No.

387. You do not depend upon photography to enable you to multiply copies for sale?—Not in the ordinary sense; but if Mr. Fox Talbot, or ourselves (for we shall soon undertake this subject also), should succeed in being able to engrave, the saving would be enormous; and when I am asked how much we have published of Scotland upon the one-inch scale, I see gentlemen expressing something like wonder in looks, if not in words, that so little has been done; but it must be borne in mind, that our best engravers cannot produce one square inch in a day of hill engraving, and that after the outline and writing has been perfectly engraved; therefore it will be readily understood, that with a large sheet containing such a number of inches it must take a very long time indeed. They cannot do an inch in a day, and probably not more than three-quarters of an inch.

388. The *Lord Advocate.*] You say the photographic process, even as it is, will very much facilitate the work of the engraver, by giving him a reduced scale?—Yes.

389. Can you so adjust the photographic process as to reduce it to any scale you please?—No, it must be within certain limits, or there will be distortion.

390. Within what limits could you reduce the 25-inch map by that process?—We could reduce about four to one, or six to one, with great safety. This (*exhibiting a photographic drawing*) is a reduction by photography of the same map which is exhibited there (*referring to a larger drawing*). This is from the 25-inch to the six-inch scale.

391. You expect that if these experiments succeed, you will not only have a reduced copy for the engraver, but the actual engraving itself?—Yes, we have cheapened the process of engraving very much indeed of late, by the introduction of punches for trees, and a great part of the writing, all the small figures for the levels, and so on, and as regards these lithographic plans (*exhibiting same*), the whole of that ornamental part which is put in there, and which at the first glance would appear to be a very expensive matter, is really done by boys, paid at the rate of about 1 *s.* a day. The stamps are used not only for the original manuscript plan, but are used also for the impressions to be taken either by zincography or lithography, or by the anastatic process, and the consequence is, that one can now make the tracings of the fields, for example, with the assistance of mere boys, and then come the trees which are all put on mechanically. Then comes all the larger lettering which is put on by stencil plates; in fact it comes to this, that if any one gentlemen were to ask for a copy of the plan of his estate upon the 25-inch scale, I believe we could give him 20 impressions by lithography or zincography as cheaply as we could hand him one manuscript copy. I am sure that any one acquainted with these processes would follow me in that conclusion. To make a transfer to the stone from which the impression is to be taken, you simply use the prepared tracing paper; that tracing paper can be at once turned over upon the stone and the impression taken; but suppose you want the one manuscript copy that I speak of, you have the same tracing to make; that tracing must then be transferred to another sheet of paper, and then that sheet of paper must be penned in, and every line gone over, and the whole work done again by the hand, instead of taking off the impression by means of the stone; therefore it is quite clear that the question of publishing these maps is settled by the demand of a single copy; and I have recommended their publication to the Government as a measure that would be of very great importance to the public. To lock the plans up would be a mode of proceeding which I certainly could never countenance, seeing how cheaply we could give copies of them. I have the detailed estimates here. The course I follow is this: I have 50 copies taken by lithography or zincography (I am perfectly indifferent which, for you cannot tell one impression from the other), and I find that the sale of 33 copies would pay the entire cost; therefore I am as perfectly certain that the entire cost of the publication would be paid, as that I am sitting here; and so also would the publication of the engraving of the six-inch plans. We have already paid back into the Treasury, for maps sold, 76,000 *l.* The entire cost of engraving Ireland upon the six-inch scale (and the area of Ireland being equal to that of Scotland, you may take the one as the datum for judging of the cost of the other) was 80,000 *l.* We are now receiving 4,000 *l.* a year from the sale

sale of the maps, a clear profit of 4,000 *l.* a year; so that it will be seen that one year more will pay for the entire cost of the engraving of Ireland, and then will come on this 4,000 *l.* a year, which very soon will pay off the entire cost of engraving Scotland; therefore, to have large maps and to lock them up, appears to me to be the most extraordinary policy that could possibly be adopted. There is no object in it; but, on the contrary, after having expended such large sums as I have mentioned to-day for the survey of Scotland, to leave it in manuscript, with the chance of fire or accident, when the publication of it would actually cost you nothing, that is a mode of proceeding which is quite foreign to my ideas.

Lieut.-Col. *Henry James*, R. E. 9 April 1856.

392. Your opinion is, that the publication of these maps would more than repay itself?—I have no doubt of it.

393. Mr. *Stephenson.*] That is upon the supposition that the sale of the six-inch map would be as good as the 25?—Supposing it is only half, it would soon pay for itself. Supposing that in consequence of our publishing the 25-inch plans they came into the market (so to speak) as rival plans, I have still no hesitation in saying that the whole would be very quickly paid for.

394. If you published the 25-inch plan, would you also publish the six-inch plan?—Yes, if you publish them both, the sale will pay for their publication.

Jovis, 10° *die Aprilis*, 1856.

MEMBERS PRESENT.

Viscount Duncan.	Mr. Lockhart.
Mr. Dunlop.	Mr. Lloyd Davies.
Mr. Ellice.	Captain Laffan.
Mr. Baxter.	Mr. Vernon.
Mr. Denison.	The Lord Advocate.
Mr. Stirling.	Mr. Stephenson.
Lord Elcho.	

VISCOUNT DUNCAN, IN THE CHAIR.

Lieutenant-Colonel *Henry James*, R. E., F. R. S., &c., called in; and further Examined.

395. *Chairman.*] YOU referred yesterday to a revision that had taken place in the Ordnance survey of Ireland; have you copies of the maps as they were published in their original state, and in their revised state?—I have, and with the permission of the Committee, I should like not only to show those, but several other plans, because I think that if they are examined now, before we go into oral evidence, it will enable the Committee to come to a clearer understanding on the subject. (*The Witness exhibited and explained to the Committee various Plans.*) The Committee will see by an examination of these impressions, that had the original instructions for the survey of Ireland been perfect, so as to include the survey of every field, a very large sum, probably not less than 400,000 *l.*, would have been saved; and therefore it appears to me, that the Committee would do well to consider before coming to any conclusion upon this point, whether it may not be the most economical as well as the most expeditious way of conducting the survey, to make it as perfect as possible in the first instance.

Lieut.-Col. *Henry James*, R. E. 10 April 1856.

396. Mr. *Ellice.*] Are you referring to the 25-inch scale?—I am referring especially to the defective instructions for the survey of Ireland, and I think that that must be a warning as regards Scotland.

397. When you say that you think 400,000 *l.* might have been saved, has that reference to the survey having been commenced upon the 25-inch scale, or to its having been plotted as it has been since?—It relates to the imperfections of the instructions for the survey of Ireland as regards details; we were told to survey the townland boundaries only, and not the fields.

Lieut.-Col. *Henry James*, R.E.

10 April 1856.

398. *Chairman.*] The result of those instructions has been, if I understand you correctly, a revision of the survey of Ireland, at a considerably increased expense?—A considerable additional expense.

399. Mr. *Denison.*] Is that 400,000*l.* in addition to the 800,000*l.* spent upon the Irish survey?—Yes.

400. Mr. *L. Davies.*] That would have been saved if the original instructions had been such as to have enabled you to carry out the map properly?—Yes.

401. *Chairman.*] And that original survey of Ireland is still going on at the public expense?—Yes.

402. Mr. *Denison.*] Can you say what the Irish survey under the two systems will cost?—It will cost 1,288,000*l.*

403. Does that include the one-inch map which is to be made also?—Yes, it includes everything.

404. *Chairman.*] Does it include the re-survey?—Yes.

405. Mr. *Denison.*] After an expense of 1,288,000*l.* you will have obtained a six-inch map and a one-inch map?—Yes, and the surveys of the towns on a large scale.

406. Have you any portion of country surveyed and available on a larger scale than six inches?—No, except special surveys, made for govermental purposes, some of which are now in progress.

407. Lord *Elcho.*] Phœnix Park has been surveyed on a larger scale than six inches, has it not?—Yes.

408. There was a six-inch survey of Phœnix Park, was there not?—Yes.

409. Why was it necessary to enlarge that survey for the Government?—It was to be the map on which all the improvements that were then contemplated were to be represented.

410. Were those agricultural improvements?—Yes, drainage especially.

411. For these purposes the Government, when they came to work, found the six-inch survey of the Phœnix Park insufficient?—I should say so.

412. And what scale was adopted?—I do not remember, although I made the plan myself; but, speaking from memory, I think it must have been the five-foot scale. I should like, in reference to the question of drainage, to be permitted to state this: that we have, recently made a map of Her Majesty's estate at Osborne, on a scale of 24 inches to a mile, on which we have represented 260 miles of drains, and that his Royal Highness Prince Albert was particularly anxious that we should have an accurate map of them, which might always be referred to.

413. *Chairman.*] Will you have the kindness to explain to the Committee why, in your opinion, if the six-inch scale, upon which Ireland was surveyed, were extended to Scotland, it would not confer corresponding advantages to Scotland to those which it conferred upon Ireland?—I have already explained that in my published letter to the Lords of the Treasury, of the 7th May 1855. The advantage to Ireland of the six-inch scale depends upon the fact to which we adverted when I was exhibiting to the Committee those maps; the townland boundaries being shown, you have shown nearly every property: whereas in England or in Scotland, where there are no such sub-divisions, unless you have the acreage of every field, you have not a corresponding advantage. The scale of six inches to the mile, as has been explained by several witnesses, is insufficient for taking the acreage accurately; and therefore it is that you require a larger scale, in order that the acreages may be correct, and that the references may be inserted; although, the same reference numbers being transferred to the six-inch scale, you can, by obtaining the accurate information which you obtain from the large scale, condense it into the small one.

414. Lord *Elcho.*] Could you, by the next day of the Committee meeting, obtain for us some account of the reasons which led the Government to have the Phœnix Park surveyed on a larger scale than that of six inches?—I know that it was because of the contemplated improvements which were very extensive in the Phœnix Park. I was living within a few miles of the place at that time, and I used to be there daily.

415. Mr. *L. Davies.*] Does it occur to you that there might be local circumstances connected with the Phœnix Park which would not be applicable to the question as to a national survey?—Certainly.

416. So that, be that scale large or small, it is not a ground for us to come to any conclusion with reference to Scotland altogether?—No.

417. Mr. *Vernon.*] Will you be so good as to inform the Committee what is the state of the primary triangulation at the present time?—The primary triangulation is that large triangulation which embraces the whole of the United Kingdom, the sides of which vary in length from about 60 to 120 miles. It has been in progress since 1784, when the first base was measured at Hounslow, and now it has, I am happy to say, been completed; within the last fortnight, I have had a summary of the results drawn up, which will be read at the meeting of the Royal Society, this day week. Some of the results are so interesting, that perhaps the Committee would like to hear them in a very concise way.

418. Do you say it has been completed within the last fortnight?—Not only is the triangulation complete, but the primary levelling is complete. We are therefore in this position now, that we are as able to commence any portion of the Hebrides or Caithness, as we are Roxburghshire or any other place.

419. Mr. *L. Davies.*] You have done that which is the preliminary step to, and is essential for, the large system of mapping?—Yes.

420. And that economises the expenditure?—The expense that has been incurred has been very great, and that is all closed now.

421. Mr. *Denison.*] Would not that expense have been just the same for the one-inch as for the 25-inch?—Yes, nearly.

422. Mr. *Vernon.*] Colonel Dawson yesterday gave an opinion with regard to the 12-inch scale, and I observe that Colonel Pasley has also given a strong opinion with respect to the 12-inch scale; what is your opinion with regard to the six-inch scale in contradistinction to the 12-inch scale?—I look at the question as a practical man, and it is very important that I should take a practical view of the subject, inasmuch as I am the officer in charge of the whole survey. It will be in the recollection of the Committee that the order for this large scale was given on the 25th of July 1854. I did not take charge of the survey until the 11th of August following; I therefore was not consulted in any degree as to what this large scale should be, and my name does not appear in the voluminous correspondence which has been laid before Parliament; I believe that my name is not mentioned in that book at all. I therefore had the Treasury Order before me upon which I was to act, and the very same day I issued orders to all the people engaged upon the survey to commence upon that large scale; I did not look right or left, but I went straightforward with that order before me; but I had this to consider: we had now got six counties engraved upon the six-inch scale, and I considered that to apply that large 25-inch scale to the Highlands would be absurd; I had to consider that the six-inch survey was eminently useful for all hydrographical purposes.

423. Lord *Elcho.*] I do not think that the Treasury ever purposed that the 25-inch scale should be extended to the Highlands, did they?—The order was general that the 25-inch scale should be adopted. I had to consider that a certain number of counties were actually engraved upon the six-inch scale; I conceived that the six-inch scale was quite sufficient for the Highlands, that that was no more than sufficient for the uncultivated districts, that it was absolutely essential for the long seaboard of the country, and that it was absolutely necessary for geological purposes; and taking all these subjects into consideration, and having the example of the French people before us, who, notwithstanding their having their *tableau d'assemblage*, as they call it, upon various scales, their cadastre being on the 25-inch scale reduced, as a preliminary measure, all their plans to a scale of 1 in 10,000, I had no hesitation, with all these data before me, in coming to the conclusion that the proper and safe course was to have the whole of the uncultivated districts upon the six-inch scale, and then to reduce the cultivated portion also to the six-inch scale, so as to make the whole survey complete and consistent with itself. If on the one side you have the six-inch scale, it will be insufficient for the cultivated districts; and if you extended the 25-inch scale to the Highlands it would be absurd; so that the safe course for you to follow is to adopt that arrangement which I submitted in that letter of the 7th of May 1855.

424. Mr. *Vernon.*] I think I gather from what you state, that having a six-inch scale begun, you would not think at all of the 12-inch?—Certainly not; I conceive that the six-inch scale should be adopted.

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

425. What do you consider to be the great advantages of contouring?—I am glad you have put that question to me, for this reason; contours have been in the numerous discussions which have taken place upon this subject, treated as if they were a sort of luxury; now that is an entirely erroneous view of the thing; it is simply a question between one mode of recording the levels and another. The expense of the one as contrasted with the other is much the same, and the results to be obtained are, in my estimation, infinitely greater by this system of contouring than by the ordinary system of levelling. I take that to be a proper view of the subject.

426. In your opinion, contouring is of advantage, as giving the general levels of the country?—Yes.

427. If we had not those we should have nothing but road levels, which would not answer general purposes, and especially railway purposes?—I did not say that they would not answer, especially in the presence of Mr. Stephenson, who is much more competent than I can be to form an opinion upon the subject.

428. What in your opinion is the best scale that is applicable for contouring?—I have never gone into the question as to what is the best scale; the question is, what is to be done in a certain state of the survey? and I have no hesitation in saying that it should be the six-inch scale; although if you put the question as a separate question, what is the best scale? I might answer differently.

429. Will you describe, if you please, the general system of contouring?—The primary levelling having been established, and the levels recorded upon the milestones, churches, and prominent objects throughout the country, we are at all times enabled, from "bench marks" as they are technically called, to run a level either to the 25, 50, or 100 feet, or any other level that may be required; the practical operation afterwards being, when you have reached the zone, to put up the instrument, and trace out by means of pickets where the contour would run, and afterwards transfer it to the map.

430. Do you imagine that hill-sketching would supersede the necessity for contouring?—Certainly not.

431. Will the hill-sketching be of any practical use in making sections?—Not accurate sections.

432. Would not contouring be of great public utility, by enabling the public to make sections for general purposes without the necessity of going on the ground, except for working purposes?—Certainly. On a contoured plan you can make a section of the country in any direction you please; and more than that, you can make from it a model of the country.

433. It appears from what you have said, that in your opinion the 25-inch scale is the best for property and acreage purposes, the six-inch scale for geographical and hydrographical purposes, and the one-inch for geographical purposes; am I right in this?—Yes.

434. It appears, then, that the question resolves itself into three points; public utility, expense, and time; the question of public utility, I think I have gathered from answers to previous questions, is established; then with regard to the question of expenditure, the total expense, I think you say, was to be 917,000 *l.*, of which one-fourth part has already been expended?—Yes.

435. There remains, therefore, three-fourths of that sum to be expended, or we will say, in round numbers, about 700,000 *l.*; and of that you think a total of 147,000 *l.* would be eventually returned by the sale of the maps; is that so?—Yes; the sale of the maps brings in at present 4,000 *l.* a year; but 40 years hence the sale of the maps will not cease; and as soon as the maps of Scotland are engraved, and if the engraving of the maps of England goes on, that 4,000 *l.* will come up to something like 12,000 *l.* or 15,000 *l.*, or probably 20,000 *l.*, and then you will have created an annuity to that amount. I stated in my evidence of yesterday that we have already returned 76,000 *l.* to the Treasury; therefore 147,000 *l.* of that 700,000 *l.* would be returnable within a certain period. The sale does not cease; and one of the great advantages of putting the maps upon copper is, that you have your maps and can produce your copies just in the same way as the impressions, some of which are here now; that of Aldershot, for instance; the plan from which that was taken is probably 50 years old.

436. Therefore, in point of fact, to narrow the question, we should have about 500,000 *l.* to find, which would produce no money return?—It produces no money

money return in one sense; but with the evidence that Colonel Dawson gave the Committee yesterday, to the effect that two millions of money was expended for the Tithe survey, that you are now going on with another survey for the Inclosure Commissioners, which will probably cost half as much more, making together three millions, and that the sum which has been paid for the 8,054 miles of railway in England amounting to 150,000*l.*, it is a matter of great importance to prevent such an outrageous waste of the money of the public in future years; that is a source of saving to which you must look; and you must look also at the facility which will be afforded for carrying out the laws that are in existence, and which cannot be done without reference to maps on a proper scale. Let me for a moment call the attention of the Committee to the evidence of Mr. Henry Warburton, a gentleman of most distinguished ability, with reference to this question. It will be found in page 325 of the printed Correspondence. This is with reference to the Tithe survey. "It is due to the Tithe Commissioners and to their consultee, Colonel Dawson, to observe that they are not chargeable with the defects of the existing tithe maps, since, in 1837, before a Committee of the Commons, of which Committee I was a member, they gave full warning that the maps prepared under the direction and at the expense of the parishes were and would be very inaccurate. The country is now reminded of the penalty it incurred by not placing at that time the direction of the requisite parochial surveys in the hands of the Ordnance. There are no public maps existing, or next to none, of an accuracy and on a scale sufficient for a system of registration." I will also, with the permission of the Committee, read another paragraph in page 328: "I have considered the national survey only in the relation it bears to one great purpose, that of registration. If the scale of the map is sufficiently large for that purpose, it will be sufficiently large for every other purpose requiring a map on an extensive scale. It is not because I undervalue the importance of the other purposes that I have passed them over without notice; for I consider them as sufficiently weighty and numerous to justify and demand the construction of a public map on the scale above recommended, even though the measure sanctioned by the approval of Lord Langdale's commission were abandoned. For instance, the townland survey of Ireland was undertaken for the purpose of equitably apportioning the grand jury cess, amounting in 1824 to an annual charge of 750,000*l.*, and the survey has cost, to the present time, about 820,000*l.*; that is more than one year's local taxation. The local taxation of England and Wales, according to the Report of the Commission on Local Taxation, 1851, amounts to an annual sum of between eight and nine millions sterling; and the survey on the proposed scale, according to the highest estimate per acre, would cost considerably less than half a year's tax. There never was a case, I think, where capital could be more profitably expended."

437. *Chairman.*] Do you adopt those sentiments?—Entirely.

438. Mr. *Vernon.*] To narrow the question, again, to the subject of the immediate expenditure in what I may call dead money, I bring the sum to be expended to about 550,000*l.*; will you be good enough to give us some idea of what length of time it would take to expend that money, and how much per annum we should be obliged to find to carry the work into effect?—The time that would be required to carry the work into effect would depend principally upon the amount of the annual grants; this year we have had 50,000*l.* granted for the survey of Scotland, on the assumption that it will cost 550,000*l.*; and in that way it would take eleven or twelve years; but I should have no hesitation in saying that if Parliament should choose to grant larger sums, we can very materially shorten that period; I think I could safely say we could get the whole survey done in eight years. I might add also, that in consequence of the peace, not only have we the power of getting back several officers who were formerly employed in the survey, but who are now with the army in the East, but it has been suggested that instead of reducing the corps of Sappers and Miners to the full peace establishment, there would be no objection raised on the part of the military authorities to give us two more companies for the survey; so that we should soon be able to have a large trained body of men. That would require, however, a reference to Parliament to meet the extra expenditure.

439. At all events you look to about eight years as the minimum time for completing the survey, and to about 10 years as the maximum?—It depends on the

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

the amount of the grants; I could not, I think, say that I could do it in less than eight years with any amount of money.

440. *Chairman.*] Will you state your reasons for that?—The great difficulty of training so large a number of hill-sketchers as would be required, and the still greater difficulty of getting the necessary number of engravers for the work. I may mention that Captain Benham, of the United States, the engineer who was engaged on their national survey, has been throughout the whole Continent and this country, and has found the greatest difficulty possible in finding engravers for hill work; he has one of our people now, I believe.

441. Mr. *L. Davies.*] Will you be kind enough to state what scale you think it requisite to apply to the Highlands?—The six-inch scale.

442. When you spoke of the large outlay that has taken place upon railways, you merely meant that as an example; because that outlay having been already made, would not of course be saved hereafter; can you give us any approximate calculation of the saving that would be effected by railways hereafter, if this plan were adopted?—I believe, nay, I feel certain, that had the survey upon the 25-inch scale been in existence at the time the great railways were in progress, not only would the cost of the detailed surveys, amounting to at least 250,000 *l.*, have been saved, but, inasmuch as the proprietors of the ground to be purchased through which the railways went would have had confidence in that map, it would have so far facilitated the negotiations respecting the purchase of the land, that when I say 250,000 *l.* would have been saved, I should perhaps have more nearly approached the truth if I had quadrupled that amount.

443. That is retrospective; but can you with reference to railway purposes, give us any prospective advantage that will accrue to them from the large map which you contemplate; or do you merely allude to what has already taken place as an argument to show that future advantages may be anticipated?—Wherever a railway runs, and that map exists, a proportionate amount of expenditure will be saved. If you refer to the evidence given by Sir John M'Neill before the Commission in 1851, you will find he says, that even with a six-inch survey in his hand, the saving to him was 10,000 *l.* even in the work in which he was engaged; and he stated that he went over 2,000 miles in every imaginable direction when he was tracing the lines for railways, and never found a single error in the Irish survey; that is in his evidence before the Committee of 1851.

444. You have said that 5,000 *l.*, 10,000 *l.*, and eventually 20,000 *l.* a year would be received from the sale of these maps; do you mean that that would be in perpetuity?—I believe that there is no end to the demand; I believe that whenever a lease is made, or whenever property changes hands, or whenever any public work is carried on, such as drainage on the construction of new roads, or when valuations are made, they will always be based on this Government cheap map sold at only 2*s.* a sheet.

445. Mr. *Denison.*] you have praised the system of France very much as contrasted with our own system; if I understand you rightly, France has only published one map, upon the scale of about one inch to a mile?—They have only published that and certain maps of districts which you may call historical maps; maps of districts upon which some great battles have been fought; special maps, you may call them, but I am not aware that they have published either the cadastre or a map, on the uniform scale of six inches to the mile; but I have been given to understand that in consequence of our having exhibited those maps at the great Paris Exhibition, the French officers think that they have been wrong in not having published them.

446. When in any department requirements have been made for anything on a larger scale, how has that been supplied to them, do you know?—They have copies of the large cadastre in each commune.

447. Copies taken how?—In manuscript; but they are deposited with some of the public officers for reference, just as our own Tithe surveys are deposited in every parish for reference.

448. If in your view a complete system should be decided upon, and that complete system should be extended to England, could you say at all what the time and what the expense would be as regards England?—I made that estimate at the request of Lord Elcho some time ago, and I have a copy of it here; that was for the entire survey of England, supposing nothing whatever had been done.

449. What

449. What would it be, supposing you were to put your plan of a 25-inch map into operation now?—I do not think I could make the calculations mentally that would be necessary to enable me to give an exact answer; but I have an estimate here for the cultivated portions of England, drawn and published on the $\frac{1}{2500}$th scale, and the whole published on the one-inch scale without contours. I have an estimate of that, if that would answer your purpose.

450. I thought your plan was much more comprehensive?—I think this is the estimate which you would wish to have for the cultivated, drawn and published on the $\frac{1}{2500}$th scale, and the whole engraved on the six-inch scale and the one-inch scale. The total estimate for England would be 2,138,265 *l.*, of which we had expended, in December 1854, 336,756 *l.*, leaving, to complete the whole of England, 1,801,000 *l.* I stated in my evidence yesterday, that whilst the French Government undertook their survey on the complete system of scales, they did it with the clear understanding before them that they were to represent a hundred million separate parcels of land; but I forgot to state, also, that the estimate which was then before them was upwards of four millions of money. They had four millions before them in the estimate when they commenced their operations; this amount was derived from the assumed cost of 8¾ *d.* per acre, but this has been considerably exceeded.

451. But France is a very large country?—Yes.

452. I thought you had said, that if the survey were made on the 25-inch scale, it would be very bad economy, in your judgment, not to print it?—Certainly.

453. The complete system would embrace the printing and publishing of the 25-inch map, would it not?—Yes, it would pay itself. There is no object in not doing it.

454. In the estimate you have just given, have you included the cost of printing the 25-inch scale?—It is included; all expenses are included. I had better state that the engraving is put down at 80,000 *l.* for 30,000 square miles; that is equal to a penny an acre; but if you contrast, as I think it would be well worth the while for the Committee to do, the six-inch scales of England, Ireland, and Scotland, you will get such a pictorial representation of the different states of the cultivation of the country as will enable you to see that the quantity of engraving upon the maps of Scotland is very much less than it was in Ireland, and therefore the expense of it will be very much less; and with regard to the large quantity of uncultivated ground that there is there, it will require scarcely any engraving at all; and I may say, that in putting down a penny an acre as the cost of publication, I know that that will cover the two.

455. Do you intend that the sum you have mentioned will cover both the survey and the publication of the 25-inch, the 6-inch, and the one-inch?—Yes, and the contours.

456. *Chairman.*] In fact it would cover every expense attending the survey?—Every single expense.

457. Mr. *Denison.*] You say, that the question of contouring which had been considered in Lord Elcho's Committee, had perhaps not been regarded quite in the light in which you yourself now regard it; the decision of Lord Elcho's Committee was, that there should only be a one-inch map, was it not?—Yes.

458. In accordance with such a decision, would you yourself have recommended a contour line over the one-inch map?—I should recommend a few contours, to give you such a result as is shown on the one-inch map of Edinburgh.

459. At all events on the one-inch map the contouring would only be very partial?—Very partial.

460. Mr. *Baxter.*] Do I understand you to say, that the Government of the United States has undertaken the survey of that country?—The survey is called a coast survey, that is under the Government, like our own hydrographical survey; but they are extending it inland, and although it still goes under the name of the coast survey, it is becoming nevertheless a survey of the whole country.

461. Have they adopted a uniform scale?—No, not a uniform scale like our own hydrographical plans; the scales are various.

462. You contemplate engraving and publishing the maps on all the three

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

scales; which map in your opinion would by its sale prove most remunerative? —I am not prepared to say, but I think the return of sales already would show that; I have here an extract return of the whole of the sales made up to the end of last month, which with the permission of the Committee I will hand in.

[*The Witness delivered in the following:*]

RETURN showing the Net Sale of the ORDNANCE MAPS during the Year ending 31 March 1856.

SCALE.	DESCRIPTION OF MAPS.	Number of Sets Sold.	Number of Sheets Published.	Number of Sheets Sold.	AMOUNT. £.	s.	d.
One-Inch	England and Wales	144	90	12,989 ½	976	–	4 ½
Six-Inch	Aldershot	27	1	27	3	1	3
	Edinburgh	20	25	509	81	8	1 ½
	Fife and Kinross	31	20	621	92	17	6
	Haddington	25	22	554	81	8	1 ½
	Kirkcudbright	7	58	417	63	15	7 ½
	Lancashire	11	119	1,292	274	16	10 ½
	Lewis Island	4	49	181	26	16	3
	Wigtonshire	4	38	170	24	8	1 ½
	Yorkshire	17	233	3,857	689	11	7 ½
Five Feet	Ashton-under-Lyne	–	16	4	–	6	–
	Blackburn	2	14	33	2	9	6
	Bolton	5	18	89	6	13	6
	Bury	3	5	15	1	2	6
	Bacup	1	3	3	–	4	6
	Burnley	1	13	14	1	1	–
	Bradford	6	12	65	4	17	6
	Chorley	5	3	15	1	2	6
	Clitheroe	–	3	1	–	1	6
	Cupar	1	9	9	–	18	–
	Dumfries	5	9	42	3	3	–
	Dewsbury	1	9	6	–	9	–
	Doncaster	–	6	2	–	3	–
	Dalkeith	8	2	17	1	5	–
	Edinburgh	7	54	393	29	10	–
	Huddersfield	–	14	2	–	3	–
	Halifax	3	13	45	3	7	6
	Haddington	32	2	65	4	17	6
	Hull	16	11	171	12	6	6
	Knaresborough	1	6	8	–	12	–
	Keighley	–	4	1	–	1	6
	Liverpool	3	50	169	12	13	6
	Lancaster	4	20	75	5	12	6
	Leeds	2	25	64	4	16	–
	London	14	400	5,497	305	4	–
	Manchester	4	49	195	15	13	–
	Middleton	1	3	3	–	4	6
	Malton	2	3	6	–	9	–
	Musselburgh	3	12	42	3	5	–
	Middlesborough	7	4	28	2	14	–
	Newton-upon-Ayr	–	–	5	–	10	–
	Oldham	–	6	1	–	1	6
	Preston	1	25	28	2	2	–
	Pontefract	–	6	2	–	3	–
	Rochdale	2	15	23	1	14	6
	Rotherham	1	6	7	–	10	6
	Selby	2	4	8	–	12	–
	St. Helen's	1	9	10	–	15	–
	Stockport	1	12	12	–	18	–
	Sheffield	6	36	222	16	15	–
	Todmorden	2	5	10	–	15	–
	Ulverston	3	3	9	–	13	6
	Wigan	1	9	13	4	16	–
	Wakefield	6	15	92	6	18	–
	Warrington	1	14	15	1	2	6
	Whitby	1	4	4	–	6	–
	York	–	21	14	1	1	–
12-Inch	London	54	44	2,399	153	10	6

SCALE.	DESCRIPTION OF MAPS.	Number of Sets Sold.	Number of Sheets Published.	Number of Sheets Sold.	AMOUNT.
					£. s. d.
$\frac{1}{2500}$ Scale	Aldershot	-	-	2	– 4 –
	Abercorn	4	13	52	4 6 –
	Arngask	1	16	15	1 7 –
	Bishop Wearmouth	-	-	1	– 2 –
	Boldon	1	11	11	– 16 6
	Colmonel	-	-	6	– 12 –
	Dinsdale	-	6	3	– 6 –
	Dalmeny	2	17	33	2 9 6
	Hurworth	2	14	30	2 10 –
	Kirkliston	6	14	79	5 19 6
	Long Newton	2	12	24	– 18 –
	Middleton St. George	2	9	21	1 11 6
	Seaham	1	9	9	– 13 6
	Sockburn	1	3	3	– 4 6
	Whitburn	2	13	26	1 19 –
Six-Inch	Ireland	3	1,991	5,498	827 15 7½
One-Inch	Ireland	-	-	158	3 6 6
Sundries	Great Britain	-	-	1,810	164 – 9
One-Inch	Scotland	-	-	18	– 16 6
			TOTAL - - - £.		3,952 12 3

463. Do you think there would be any material saving effected by omitting the engraving and publication of the map on the six-inch scale?—Certainly there would be no saving, as the expense of engraving and publication would be paid for by the public themselves; and to make plans at a large expense, and then to lock them up, is a line of policy, the expediency of which I do not comprehend at all.

464. You have stated that whether you finish the survey of Scotland in eight or 12 years will depend on the amount of the annual grant which you obtain from Parliament; does that include the time necessary for engraving and publishing the maps?—That is the shortest time within which I think it can be done, and it will require great energy and good arrangement on our part to enable us to do it within that time; but I think I can do it.

465. Within what time, supposing your suggestion with regard to the scales were adopted, do you think we should be able to purchase in the shops maps on the one-inch scale?—In eight years, I hope. If the course which has hitherto been pursued with regard to this unfortunate survey should be continued, it is utterly impossible for any officer to make such calculations as will enable him to say when the survey will be finished. The Committee will bear in mind that, between 1851 and 1856, we have been surveying for the one-inch scale, which has been thrown aside. We remained 15 months without any orders as to any scale at all.

466. *Chairman.*] What is the date of that?—I may mention incidentally that this is what I drew up at the request of Lord Palmerston, and it was then that Lord Palmerston very judiciously, as I think, said, "Until this question is settled I will take this course: the cultivated districts shall be upon the 25-inch scale, and the uncultivated on the six. That is the safe course, and let the Committee or Parliament do whatever they please, there will be no waste." I think that his Lordship took a very clear and a very judicious view of the subject.

467. Mr. *Ellice.*] Was that conversational or documentary?—Conversational. In the memorandum which I drew up at the request of Lord Palmerston, and which is in page 12 in the printed papers relative to the Survey, I stated, "It will be seen by the Treasury Minute of the 15th April 1854, that whilst Parliament was increasing the grants for the survey, and the Ordnance was proportionally increasing the surveying force, to enable them to carry on the works with greater rapidity, 15 months elapsed between the 15th April 1853 and the 15th April 1854, before orders were given to draw the plans upon any scale. The loss of time and money which has been caused by these repeated changes of orders, and by the absence of all orders, has been very great indeed."

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

468. Mr. *L. Davies.*] The publication of these maps will, in your opinion, be completed within 10 years, if no impediment be presented, and if the Government be favourable to the view which you take?—Certainly.

469. Mr. *Ellice.*] And if the money is produced?—Yes. The Committee will understand the embarrassed position in which we were; we actually returned back to the Treasury 9,000*l.* or 10,000*l.* of money which was unexpended: we did not dare to increase our force.

470. Mr. *Denison.*] If a 25-inch map and a six-inch map were both published and purchasable, which map do you think proprietors would purchase for the purposes of their property?—I think they would purchase both; but I should say, undoubtedly, they would purchase the large one.

471. Do you contemplate that a proprietor buying a map for the purposes of his property would purchase a map upon two scales?—If he could buy them for 2*s.* a sheet, each sheet containing 1,000 acres.

472. Why would he do so?—The probability is, that no considerable proprietor would have an estate that would not extend over several sheets on the 25-inch scale; if he were a large proprietor it would be utterly impossible for him to put together maps on that scale, so as to bring under his eye his property at one view; but on the 6-inch scale he would have the accurate data of the large plan condensed, and would not only see his own property, but the property of his neighbours around him. He would see how he was bounded, and so on. Every proprietor would have one for his own use, and the tenants also, for their use.

473. Mr. *Ellice.*] I understand from the whole tenor of your evidence, that you agree with Sir Charles Trevelyan, that this subject of your map is divided into two distinct objects; namely, that the one-inch map would serve all purposes for which a geographical map will be wanted; and the second, that the property map will serve exclusively for purposes connected with individual property, and not for geographical purposes?—I entirely agree in that view.

474. I did not quite gather from you whether you thought, with regard to the property map, that both the 25 and the six-inch scales should be published?—Yes.

475. You said you would not apply the large scale to the Highlands?—No.

476. You would survey the Highlands upon the six-inch scale?—Yes.

477. And would you publish upon the one-inch scale, or both?—Upon both, it being always understood that the map on the scale of one-inch is necessary as a military topographical map.

478. To whom would you propose to leave the discretionary power of distinguishing what are Highlands and waste land?—We require no instructions. If the Committee will do me the favour to refer to the plan of the parish of Largs, in Ayrshire, which is here, and which contains a portion of cultivated and a portion of uncultivated country, it will be seen how, from the circumstance of the area of the six-inch scale being exactly equal to 16 sheets of the larger scale, I can, without confusion or difficulty, trace through all the sinuosities of a glen or strath, those portions necessary to be put on a large scale; therefore we require no instructions whatever. The fields and fences are indications where cultivation stops.

479. You do not propose any arbitrary boundary between the Highlands and the Lowlands?—It would be impossible, I believe, for any one to do that; at all events, I should not like to attempt it.

480. Do you contemplate that this survey should now be adopted as a principle, to be afterwards extended over the whole country?—As regards England, I have no doubt at all about it.

481. And Wales and Ireland?—Wales I include, but I confess I have some very great doubts as to the policy or necessity of extending it to Ireland. I have explained to you the advantage of the survey they have got; but, in addition to that, you have in this correspondence the recorded opinion of Colonel Larcom and Mr. Griffiths, most competent witnesses, who say, that were they about to survey Ireland again, they would again adopt the same scale, and they give their reasons for that. Now, with that evidence staring me in the face, as also the evidence which I have here in letters from Mr. Griffiths himself, stating how perfectly the revised maps have answered all their purposes with reference to valuation, I confess I should not like to recommend that a few more hundred

hundred thousand pounds should be expended upon that which they do not think would be necessary.

482. The contouring which is now going on is upon the old system, is it not? —I am sorry to say that the confusion, so to speak, into which we have been thrown by the suspension of orders for such an immense time, has deranged our proceedings to a certain extent, and that we are not contouring in England at all at this moment. Yorkshire is finished. A great part of Durham is drawn on this large scale, but we have no orders to reduce it to the six-inch scale.

483. In the survey now going on in Scotland the contouring is proceeding, is it not?—With reference to that portion which is on the six-inch scale, but not as to the other.

484. You do not agree with the Supplemental Report of the Commission, of which Lord Ellesmere was at the head, with regard to a modified system of contouring?—Yes, I do agree with it; and what is more, I am acting upon it now.

485. As regards the survey of Scotland, both Highlands and Lowlands, do you propose that a simplified system of contouring should be adopted throughout?—Yes; I should run those few contours not only in order to give us the exact sections of the country, but that they might be the basis of hill-sketching, which is very important indeed; because with regard to a map which is contoured, the errors, so to speak, of the sketcher are limited; he cannot get away from the contouring, because his work must fall within it; therefore it is a very important element.

486. Assuming that we have the six-inch survey for the Highlands, do you think that contouring, as showing levels and any points, would be a matter of less interest in that mountainous country than it would be in a country less mountainous?—I think it would be of highest interest to have some contours through the Highlands.

487. You have said that the sale of the maps have now realised somewhere about 4,000*l.* a year; I presume that that applies to the whole country?—Yes.

488. England and Ireland?—Yes; I have the exact sum.

489. It applies mostly to the one-inch map, does it not?—No, there is an enormous sale of the large five-feet plans. I have here a return, showing the net sale of the Ordnance maps during the year ending the 31st day of March 1856. Only a few days ago, the one-inch map for England and Wales produced 976*l.* 6*s.* 4½*d.* Unfortunately, this return as to the six-inch map is not totalled, but I see that for Yorkshire alone the amount is 689*l.* 11*s.* 7½*d.*

490. Is that the six-inch map?—Yes. Lancashire is the next largest sale; that is 274*l.* 16*s.* 10½*d.*

491. Is that the six-inch?—Yes; so that there is a thousand pounds sale nearly between those two counties alone in one year. This, I may observe, is the net produce. We give 25 per cent. for agency.

492. How long have the maps for those two counties been published?—Yorkshire is not all published at this moment.

493. How long has Lancashire, the other county, been published?—I think about two years; but I am not quite sure as to the date.

494. Do you apprehend that the sale of the maps in those counties will in future years be maintained to that large amount?—No, but we have this curious fact, that there is a steady sale of the maps of Ireland, although they have been published ever since the year 1846. I see that in the last year, they sold 305*l.* worth of the large maps of London.

495. Upon what scale were they?—Five feet and one foot. For the map of Ireland we have received, as the net produce, 827*l.* 15*s.* 7½*d.* within this last year.

496. *Chairman.*] Is that after deducting the 25 per cent. for agency?—Yes.

497. Mr. *Ellice.*] Have you any data of the past to go upon, enabling you to calculate what will be the sale of the property map on a large scale?—No.

498. Taking the map of Hopetown House, and the grounds surrounding it, do you conceive that that map will be in any very general demand, or of any practical use except to Lord Hopetown, or persons interested in that property? —No, I do not conceive that it will be in very general demand; but it must be borne in mind, that I can give Lord Hopetown a dozen copies of that map lithographed for less money than I could let him have a manuscript copy of it.

499. Then, after the sale of that map in the first year, do you apprehend that there will be much, if any, demand for it afterwards?—Yes; I conceive there will

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

will be constant demand for those maps; that if they exist, no lease will ever be made without their being used; they will be used for all parochial purposes; there are many purposes for which parish authorities will require them: as, for instance, for the purpose of periodical valuation. They will also be extremely important, with a view to agricultural statistics.

500. Lord *Elcho.*] I suppose that some portion of this large map on the 25-inch scale has been engraved for sale, has it not?—Yes; that is, it has been lithographed.

501. What portion?—Parts of Ayrshire and Dumfriesshire, and part of Linlithgowshire and Durham.

502. I presume that the return which you have handed in will show what the sale has been of those portions of the large map which have been engraved, and which the public might purchase?—When I say that they are engraved, I should also say that they have only just been engraved, and that they are scarcely exposed for sale at all at present.

503. Mr. *Ellice.*] Have you any detailed account of how the money which has already been expended in this survey has been appropriated year by year since the commencement of the survey of Scotland?—I have not made up that return.

504. Will you have the goodness to do so, and furnish us with it?—Yes. I can state this, and I think it desirable to put it on record, that the original map of Wigtonshire, Ayrshire, and Kirkcudbrightshire, which the Commission have examined, cost upwards of 5,000 *l.*; that on the work we did upon the one-inch scale in Haddingtonshire, Peeblesshire, and Berwickshire, when the orders were given for the suspension of the six-inch scale, there was a further loss of 5,000 *l.*, because that work was of no use for the larger scales that have since been executed in the same district.

505. Am I to understand you as saying that 5,000 *l.* was lost in that particular case because another scale was adopted, or only because the survey was suspended?—Because another or larger scale was adopted.

506. But if it should be again resumed upon the original scale, that loss will not have occurred?—Certainly not.

507. Is there any minute or document which shows that in a case where a county had been begun upon one scale, it was left and recommenced on another; and if so, upon what authority was that done?—I can say, of my own personal knowledge, that the survey of Haddingtonshire had proceeded upon the six-inch scale to about three-fourths its extent, when we received orders to complete the survey on the six-inch scale only, and to draw the whole on the one-inch scale, and that Edinburghshire, with Wigtonshire and Kirkcudbrightshire, were to be engraved on the one-inch scale; the consequence of that was, that we drew a great part of Haddington as for the one-inch; the MS. upon the two-inch scale, but for the one-inch engraving, and at the same time parts of Peeblesshire, Lanarkshire, Linlithgowshire, and Berwickshire also on the one-inch scale; for we had to scatter our parties to work by sheets, instead of by counties. Then after a certain period came the orders for Haddingtonshire to be finished on the six-inch scale. I believe the reason why it was not included in the original order was, that they were not aware that the survey of it had advanced so far as it had; but the Committee will see that what we had done for the one-inch was not available for the six-inch, and it was thrown aside.

508. What do these estimates of expense embrace; do they embrace your own remuneration and that of all the other officers on the staff?—Yes, every single thing, including our allowance of 4 *d.* a day for wine.

509. In point of fact, there is no part of the staff engaged in this Ordnance survey that comes under any other head in the Estimates; it all comes under the head of "Ordnance Survey," does it?—Up to this year the regimental pay, every allowance to the officers and men, and every incidental expense whatever attending the survey, appeared in the Votes together. This year, without any reference to me, and I do not know for what reason, it will be seen that in the Estimates, after stating the sum required, it is said, "*Nota bene*, the above is exclusive of the expense of the four companies of Sappers and Miners employed on surveys, the same having been transferred to Vote 2, 'Land Forces.'" This is the first time that that has ever been done.

510. What is the proportion of the acreage in Scotland as compared with the acreage of England and Wales?—They are very easy to remember; England

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

is equal to Ireland and Scotland put together; Ireland and Scotland are each 30,000 square miles, and England 60,000.

511. Including Wales?—Yes, including Wales; Wales is a tenth of the whole of the United Kingdom; that is, 12,000 square miles.

512. And what is the waste land in Scotland calculated at in round numbers?—That is extremely uncertain; I have found it stated by some authors that the whole area is 29,000 square miles, and by others 31,000. Then again, the quantity of uncultivated ground has been returned as two-thirds, but we have considered it safer to take one-half as the area, that would probably have to be surveyed on the large scale.

513. Lord *Elcho.*] That is assuming a certain portion of it to be improvable?—Yes; I know the cultivated is creeping up continually, and trenching on the territory that is uncultivated.

514. Mr. *Ellice.*] Looking to the infinitely less quantity of land in Scotland that will have to be surveyed in detail, in comparison with the land that will have to be surveyed in England, the 1,000,000 *l.* that will have to be spent in Scotland, as compared with the 2,000,000 *l.* required for the whole survey of England, would seem to be rather out of proportion, would it not?—We went very carefully into the estimates. We have assumed, in our calculation for England, that seven-eighths is cultivated, instead of one-half, as in Scotland. Then we have assumed 50,750 square miles for the large plans, at 1 *s.* per acre, or 32 *l.* per square mile, 1,624,000 *l.* Then reducing the plans on the one-two thousand five hundredth scale to the six-inch scale, at 13 *s.* 4 *d.* per square mile, 33,823 *l.* Then surveying and drawing 7,250 square miles on the six-inch scale, at 7 *d.* per acre, or 18 *l.* 13 *s.* 4 *d.* per square mile, 140,166 *l.* Then engraving 58,000 square miles on the six-inch scale, at 1 *d.* per acre, or 2 *l.* 13 *s.* 4 *d.* per square mile, 154,666 *l.* Hill-sketching, 58,000 square miles, at 1 *l.*, 58,000 *l.* Engraving, 58,000 *l.* square miles, at 1 *l.* 3 *s.*, 66,700 *l.* In fact, every single thing has been fully gone into. That makes up a total of 2,138,265 *l.*

515. *Chairman.*] I believe a portion of England is already surveyed on the 25-inch scale?—Yes; the whole of Durham, with the exception of two parishes, which were to have been done by contract; but the surveys, or one of them, was not sufficiently accurate, and was rejected.

516. Mr. *Ellice.*] Is that included in the estimate of the 2,000,000 *l.*?—Yes.

517. Two millions one hundred thousand pounds is the cost of the survey and re-survey of England, out of which certain moneys have been spent. Now I want to see the same calculation as regards Scotland; take the number of acres in the first place?—Fifteen thousand square miles, at 1 *s.* per acre, or 32 *l.* per square mile, 480,000 *l.* Reducing 15,000 square miles on the one two-thousand five hundredth scale to the six-inch scale, at 13 *s.* 4 *d.* per square mile, 10,000 *l.* Surveying and drawing 15,000 square miles on the six-inch scale, at 7 *d.* per acre, or 15 *l.* 13 *s.* 4 *d.* per square mile, 280,000 *l.* Engraving 30,000 square miles on the six-inch scale, at 1 *d.* per acre, or 2 *l.* 3 *s.* 4 *d.* per square mile, 80,000 *l.* And as I have already mentioned to the Committee, I am quite sure that I shall very much reduce that. Then "Reducing 30,000 square miles on the six-inch plan to the one-inch scale, at 2 *s.* per square mile, 3,000 *l.* Hill-sketching, 30,000 square miles, at 1 *l.*, 30,000 *l.* Engraving 30,000 square miles, at 1 *l.* 3 *s.*, 34,500 *l.*" That makes a total of 917,500 *l.* I may state with reference to these estimates that I am perfectly certain that that is the very outside sum that the survey will cost, and I have a firm confidence that it will be done for less; but it is a question of so much importance, that as it appears to me a difference of a few thousand pounds more or less, if the large scale is desirable, is a matter of very minor consideration.

518. Mr. *Ellice.*] You said yesterday, that there had been an Ordnance survey of certain counties in Scotland, before it was stopped, in 1827?—Yes.

519. We will take the county of Wigtonshire; that perhaps was completed at that time, was it not?—The manuscript was.

520. Upon what scale?—Two inches to the mile, for the purpose of its being reduced to the one-inch scale for engraving.

521. *Chairman.*] I need not ask whether you were at that time in charge of the Ordnance survey for Scotland?—I was not in the corps of engineers at that time; I only joined the Royal Military Academy as a cadet in 1819.

522. Mr. *Ellice.*] Wigtonshire has been completed lately, and the maps have been

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

been published upon the one-inch scale, as well as upon the six-inch, have they not?—Yes.

523. Has the survey that took place previous to 1827, the drawings of which were in the Ordnance Office, been made available for the later survey and the later publication?—No.

524. What is the reason why they have not been made available?—Because the survey on the one-inch scale is not sufficiently detailed for the six-inch scale.

525. Would the original survey have answered for the publication of the one-inch map for Wigtonshire?—Yes.

526. Therefore the re-survey was undertaken in order to produce the six-inch map?—Yes.

527. If a six-inch map had not been wanted, you need not have undertaken the re-survey at all?—No; we should probably have gone over it with a view of putting in any additional roads that had been made since; but nothing else, I presume, would have been necessary.

528. Is there that communication passing between the Ordnance Office and the Admiralty that enables the hydrographical survey and the Ordnance survey to be carried on simultaneously, and on a strict understanding with each other?—In general it is so. I have a letter here addressed to me by the hydrographer, which I should wish to read to the Committee: "Admiralty, 5 April 1856. Sir,—In reply to your letters inquiring as to the comparative utility of the six-inch and one-inch scale of the Ordnance maps for the purposes of the coast survey, I should have had no hesitation myself in at once offering a decided opinion in favour of the former. But knowing that several of the Admiralty surveyors were now using, and had for many years been making use of the Ordnance maps of Ireland and Scotland, I thought it better to refer your letter to those officers separately, in order to obtain their several opinions on the subject, and I have now the pleasure to enclose their replies. The officers are Captain Bedford, R.N., with Commanders Beechey, Church, Edye, and Mr. Hoskyn, on the coast of Ireland; Captain Williams, Commander Aldridge, Lieutenant Cox, and Mr. Calvert, in England; and Commanders E. J. Bedford, Wood, and Lieutenant Thomas, in Scotland; all of them experienced and able surveyors. It will be seen from their letters, that they are unanimous in expressing, first, the great value of the Ordnance maps, to the coast survey. Secondly, that the maps on the six-inch scale, from their ample and clear details, furnish the surveyor at a glance, with a general knowledge of the configuration and features of the coast, the high and low-water line, of which he is about to delineate, and to which it is his business to add the soundings, and submarine features. Thirdly, they supply such minute and accurate data, that the surveyor in his off-shore soundings is often enabled to make use of some whitewashed house or mill to fix his position, and thus accomplish a good day's work, when, from the trigonometric points being unexpectedly covered with clouds, or partially obscured by mist, it would otherwise be lost. Fourthly, that the map on the one-inch scale is comparatively useless for the purpose of a nautical survey, all one work being plotted on a scale of six, four, or two inches to a mile; and as you are aware, although we may easily reduce with accuracy, it is contrary to the first principles of surveying to enlarge a drawing from a small scale. Fifthly, that the saving of time arising from having the six-inch Ordnance maps to work from, amounts in some cases to fully one-half, but in all cases to two-fifths, and consequently there is a similar saving in expense. I may add, that within the last fortnight it has been my duty, in making a return, moved for in the House of Commons, to report to Parliament, that the delay in completing the hydrographical survey of the lochs and sounds on the north-west coast of Scotland, arises from not having any Ordnance map to work upon; consequently the marine surveyors have had to execute the whole of the topography, thus consuming 10 years in a survey that ought to have been finished in half that time, and would have been so finished had we had the advantage of a six-inch Ordnance map. I gladly avail myself of this opportunity of expressing my own opinion; and I am authorised to add also, that of my predecessor, Rear-Admiral Sir Francis Beaufort, K. C. B., as to the value and importance of the large scale Ordnance maps to the coast survey, and of bearing testimony to the great liberality and cordial co-operation the Admiralty have ever experienced from the several directors of the Ordnance

Survey

Survey of the United Kingdom.—Your obedient servant, *John Washington*, Hydrographer."

529. Are you aware that, as to the principal altitudes which have been taken by the Ordnance surveyors on the west coast of Ireland, the hydrographical surveyors have not been guided by those altitudes, but have again re-measured them upon their own survey?—I am not aware of it. As a matter of curiosity they may have made levels when we have given them altitudes.

530. Do you know to what extent inland the hydrographical survey, which is now proceeding, extends?—It generally extends for half a mile or a mile inland.

531. Will that survey, extending a mile inland, be of any use to the Ordnance survey when they go to that part of the country?—I do not think that the hydrographical surveys are generally marked with the same degree of accuracy that the Ordnance surveys are.

532. You have surveyed the island of Lewis, have you not?—Yes.

533. Will the hydrographical surveyors, when they survey that coast, take your survey as their text?—I have no doubt they will.

534. Will you furnish us to-morrow, if you please, with an account of the whole expenditure that has been incurred by the survey of the Island of Lewis, upon the six-inch plan?—I will do so.

535. *Chairman.*] Was the survey of the Island of Lewis conducted while you were at the head of the Ordnance survey in Scotland?—No, and I must say with reference to it that it contains details, especially contours, to an enormous extent, through a very uncultivated moorland tract; and that an expenditure was incurred there which I for one should not attempt to justify, and therefore I should not allow it to be brought in as a unit in the calculation, which in reality it is not. I perhaps ought to state that this contouring, which is carried on to an extent which I consider perfectly unjustifiable in that island, was undertaken under extremely difficult circumstances. A party was sent there who had not been previously instructed, and so the whole cost, so to speak, of the training of that party was thrown on the cost of the work itself.

536. Mr. *L. Davies.*] Having reference to the fact of your not having superintended that survey, and that survey having comprehended things that you consider unnecessary, do you think it can at all illustrate, or that it has any bearing at all upon the system which you wish to adopt with reference to Scotland generally?—Certainly not.

537. Lord *Elcho.*] In what year did the survey of Lewis take place?—I do not remember. I was not on the survey at that time.

538. In your opinion the survey of Lewis was not conducted in such a manner as to justify us in drawing any conclusion from it with reference to the cost of the six-inch survey of the Highlands now?—No.

539. Mr. *Ellice.*] Has a map of Lewis been engraved upon the one-inch scale?—Yes, and the impression is now in the room.

540. *Chairman.*] When were you first employed as a director of the Ordnance survey of Scotland?—On the 11th of August 1854, and I have the order, which is dated the day after, for the commencement of the survey upon this scale. I have stated that we were without orders for 15 months, but, in point of fact, we were without orders for 16 months, because I did not receive the order until a month after it was issued from the Treasury.

541. When, and to whom, did you apply for instructions?—I always apply for instructions through the Inspector-general of Fortifications to the Treasury.

542. When was the first Treasury Minute dated after you undertook the survey?—On the 18th of May 1855.

543. And were the instructions which you received at that time instructions to finish the work in hand pending the result of this Committee?—Yes.

544. Mr. *Stephenson.*] Without in any way impugning the interest which sometimes attaches to contour lines, I am desirous of asking you a question or two as to their practical utility. You have stated that you think contours would be exceedingly useful in laying out lines of railway, and that where they were near to each other their utility would be the more marked?—I do not recollect having used that expression; but you will bear in mind the mode in which the contours are combined with the levels. I have explained to the Committee the mode in which the contours proceed; we have to level up to a given datum line; but that levelling is afterwards carried along the roads. Hence to reach

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

the altitude at which the contour is to stop, we go along the roads, and you have in this contoured system, therefore, a combination of the advantages of the ordinary levelling to a certain extent, with the contour system.

545. I am anxious to get from you the mode in which, if you had a contour map lying before you now, you would use those contours to assist you in fixing upon the precise course for a line of railway, or common road, or canal?—I have no hesitation in saying, that with a contoured map, such as we are now proposing, I would trace a line of railway, or any ordinary road or line of canal, with greater accuracy and execute it at a less expense by means of a line traced in the office, than I could upon the ground.

546. Having traced that line of railway on the contour map, you omitted to take into consideration apparently the position of the towns?—No; I am not going to run a railway nowhere. I run a railway between two definite points from one town to another.

547. We will go to an exceedingly marked country; we will take the contour lines, for instance, in Wales. There could be no hesitation on the part of any one walking over that country, or riding over it, in deciding, without reference to any contour map whatever, the precise railway he would be compelled to keep for a line of railway, would there?—Certainly not. There could be no question in such circumstances as to where the line of railway should go.

548. Where the country is marked?—Certainly.

549. Now, we will go to the Midland counties, where the surface of the country is scarcely marked at all. At what distance are the contour lines from each other in those counties; take, for instance, from Derby to Nottingham, or the whole valley of the Severn or the Trent?—There are none.

550. But supposing them made and contoured, would the contours then be of any value?—We should put them 25 feet apart in a country of that kind.

551. Would they guide you in deciding, in that wide flat country, the precise line for a railway?—You would go straight across a flat country, of course.

552. In countries that are not marked, you would go straight across the country, without reference to the contours, and in a country that is marked, it is sufficiently marked not to require contours?—Yes; but at the same time the great majority of the country is in an intermediate state, where the contours for that purpose would be of immense importance; but you have the evidence of those gentlemen who have been working in Ireland, where the levels are so close that they can very nearly trace the contours; indeed, a map of part of Ireland has been published, with all the zones of altitude abstracted from the published maps on the six-inch scale, and Sir John M'Neill can tell you that they have traced the railways in their offices through all the sinuosities of the ground, in consequence of having the altitudes so numerous.

553. That would be a preliminary sketch, merely requiring to be followed up by a detailed series of trial levels, would it not; or are you aware that Sir John M'Neill depended solely upon the contours that the Irish maps gave him?—I believe he did; but I have never had any conversation with him upon the subject, and therefore do not know.

554. You know that Parliament requires sections to be brought before them in great detail, and of such a nature that calculations may be made upon them with reference to the contents of cuttings and embankments, and that they must be prepared with considerable precision?—I presume that in a section such as you have to give in, and such as must form the basis of your estimates for tunnelling or for excavation, for example, it would never do unless you made a special levelling.

555. We have settled the question as regards the marked country and the undefined country, but there is an intermediate country called by the French "accidental," where the hills, or undulations rather, are thrown together in a very confused way. In a country of that kind you might trace two or three lines of railway among the contour lines; but it would require, in point of fact, a detailed levelling to be taken, in order to decide between the one and the other, would it not?—I do not think you are putting the thing exactly in its proper light. Whenever a line of railway is traced, very accurate levels must be taken over that line, so that the cuttings, and so on, may be exactly known. I do not believe that any general map of the kingdom could be made to answer such a purpose as that. If you were to follow the argument out, it would result in this, that you would have no levels at all. The question is, whether you record the levels one way

way or the other. The expense, I say, would be nearly, if not exactly, the same. If the mode which was submitted to Lord Ellesmere's Commission were carried out, it would be more expensive than the system of contouring.

556. I am not going into the question of expense; I merely want to know what your opinion is as to the practical benefits to be derived from those maps when completed, irrespective altogether of the question of expense?—Then, I have no hesitation in saying that a contour map is infinitely more valuable to railway engineers for every engineering work than any other mode of recording the levels. I may state that in certain districts I found that an immense number of plans were demanded. I sent to the agents, through whom the demands reached us, a circular letter, desiring to know for what purposes these maps had been used, and what caused the great demand for them. I received, in reply, a letter from Mr. J. Parkes, an engineer of great experience, who is carrying on some most extensive draining works in Yorkshire; and in that letter it is distinctly stated that he found the contoured six-inch plans of immense value; that they gave him his outfalls and levels; and if they will give that in a flat country, I am quite satisfied that they must be of immense advantage in tracing a line of railway.

See Appendix.

557. What part of Yorkshire was that?—Near Hull.

558. Was the estate adjacent to the river?—I know nothing of the matter personally; I only obtained the information in the way I state. I merely inquired for what purpose the maps were wanted, and who had got them, and then, after inquiry, we ascertained how far they had been found to be useful. I thought it desirable that we should know who were the parties who were really using the maps practically, and to get their opinions with regard to their utility. I beg also to refer to the letter from Messrs. Park, Son, & Garlick, engineers at Preston, on the same subject and to the same effect.

See Appendix.

559. It has been said that all lands round large towns should be contoured, with a view to determine the system of drainage to be adopted; let us take the one before us now, and with which you are quite familiar; suppose the whole southern part of London on the south side of the Thames were contoured, as it is contoured, how would those levels at all assist you in deciding on the direction of the main drain that may be made on that side of the Thames?—You must be aware, that where we have a system of contouring which extends to a large city and the country round it, you always level through all the streets, for all the towns are drawn on a large scale, and to trace the contour is a very simple matter; and when you have levels at every street and every lamp-post, you can run your eye along the street and see where the run of fall would go; you may draw the contours, if you please; it will only bring together the lines of equal altitude by maps prepared in that way, and to which the contours are added in the way I speak of, furnish, as I presume, all the information that engineers can possibly require.

560. That is the opinion which I have come to; that the contour lines themselves after the general levels are ascertained are of no use at all, and frequently, indeed always, tend in a moderately flat country to confuse an engineer; that is my experience?—I quite agree in that; contours alone, in a very flat country, are not enough.

561. Mr. *L. Davies.*] If you go to a marked country, would not the contouring be of great use to an engineer in showing the depth of a particular valley?—It would be an enormous advantage; you have only to look at the map to see where the lines would go, and what the rise is.

562. Mr. *Stephenson.*] I will take that very beautiful map of the vicinity of Edinburgh; the contours there run up into the Pentland Hills, four or five or six hundred feet?—Up to an altitude of 1,700 feet.

563. If an engineer were called on to lay out a road, or a railway, or a canal, through that country, would he for one moment hesitate about the direction, within 200 yards, in which it ought to be located?—No; you could have no doubt about it with such great landmarks as those.

564. Therefore, as far as that beautiful map of the country round Edinburgh is concerned, it really would be of no use to the engineer?—I differ from you entirely; you will understand that I am speaking of an engineer in the broad acceptation of the term; I do not limit the term engineer, as you have done, to simply tracing a line of railway, but I am speaking of an engineer with reference to all purposes of engineering for which there is a necessity for a reference to maps.

Lieut.-Col. *Henry James*, R. E.

10 April 1856.

565. Mr. *L. Davies.*] Suppose there is a valley, and a great number of small valleys running into it, would not your contouring system enable the engineer to determine by which valley he ought to diverge?—Yes.

566. Is it not a common occurrence for them to select the wrong valley, so that they are obliged to go to Parliament another year for the purpose of enabling them to take the right one?—Yes.

567. Would your contouring system avoid the necessity for that?—Certainly; suppose I tint a six-inch plan of any district through which any ordinary road, canal, or railway is to be made, or any other work of that class, you would have all the information that is necessary from the contour map, and you never could have a road run in a wrong direction if a man has any sense at all; any country gentleman looking at a proposed road across any portion of the country could trace it at once, and see it was properly laid out.

568. Lord *Elcho.*] Supposing the levels to be given accurately and with sufficient frequency, would there be any difficulty in an engineer who has to use that map for any engineering purpose drawing contour lines for himself with his pencil on the map?—He could only draw them very roughly. He would know where the contours very proximately would cross the lines of altitude, but he would have no data for the intervening ones. He could do it on the ground by the eye, of course.

569. Will you state to the Committee what the cost of contouring was as originally estimated, per acre, or per square mile; that is to say, the cost in accordance with the system which was originally adopted, and which you have described as being so extravagant?—It was 4 *l.* a square mile.

570. Will you likewise state to the Committee the cost of the modified system of contouring which you have adopted, or rather which you propose to adopt?—We have adopted it. I do not anticipate that it will cost 3 *l.*, whereas the other cost 4 *l.* In all these estimates I have always given the sum that I am perfectly certain will cover the entire expense. I think it very probable that it will be very considerably less than 3 *l.*, but 3 *l.*, I am quite certain, will cover the whole.

571. Is that per square mile?—Yes. There must be some degree of uncertainty in an estimate for such a matter as contouring; but there is this to be said, that if we came into a country where contours at close intervals would become very expensive, we should then immediately alter the intervals between the contours so as to bring the expense within a reasonable amount.

572. I think you stated in answer to a former question, that you did not dissent from the conclusions which were come to by the Committee of which Lord Ellesmere was the head; I find that one of their conclusions was, that contour lines would, to a certain extent, be a useful addition to the map on the six-inch scale, and will occasion an outlay of 5 *s.* per linear mile; what I wish to know is, whether the modified system of contouring which you say you have adopted, and which costs 3 *l.* per square mile, would amount to more than the Committee on contouring recommended, namely, an expenditure of 5 *s.* per linear mile?—I do not understand how an estimate can be based or framed on such a unit.

573. You said in answer to a question put to you, that the cost of the levels as it was proposed, I presume by Colonel Dawson, they should be taken, amounted to more than the cost of contouring as at present carried on by you?—Yes, that is my opinion; and the maps upon which I base that opinion are in this room. I am perfectly certain of the fact, that if that very identical ground, the map of which was presented to the Committee, were levelled in the way there traced, it would cost more than it would cost to contour it.

574. Was any estimate given in by Colonel Dawson of the cost of that system of levelling?—I do not recollect; but the original maps are here in the room, and Mr. Stephenson would be a very good person to whom to submit the question.

575. Your opinion is, that the cheapest and best way of showing the levels is the modified system of contouring to which you have referred?—I do not say it is the cheapest mode, but I do not think that the expense of it would exceed the expense of levelling, which has been recommended as a substitute for it.

576. Mr. *Ellice.*] You have said, with regard to the survey of the island of Lewis, that the contouring had been conducted on a very expensive scale, and one that you would never think of adopting again. Does the system of contouring that was adopted in the island of Lewis differ from the system which was adopted

Lieut.-Col. *Henry James*, R.E.

10 April 1856.

adopted in your surveys in other parts of the country?—I would beg to refer you to the engraved six-inch sheet of St. Andrew's, and the engraved six-inch sheet which contains Dalkeith, and a comparison between them and the one that you have of Lewis will at once show that there is a great difference between them.

577. Are those sheets to which you have referred contoured at all?—Yes, those are contoured.

578. Is that of St. Andrew's contoured?—Yes.

579. Is that upon the 25-inch scale?—No, upon the six-inch scale.

580. Did the system that was adopted in Lewis differ from the system that was being pursued with regard to contouring elsewhere at the time that the survey of Lewis took place?—Yes, and an extraordinary mistake was made. A system, which might possibly have been applicable and justifiable in Yorkshire, was applied to Lewis, where it was most improperly applied. I think that the expenditure on Lewis is not to be justified by anybody.

581. Mr. *Ellice.*] As between the new system of contouring and the old system of filling it in by the eye, will there be any material diminution of expense?—I anticipate a very considerable diminution of expense. I have stated that it certainly will not be less than a fourth, and I believe it will be half.

582. The instrumental levelling for these contours will, I suppose, be about the same?—No; the instrumental levelling will also be less.

583. *Chairman.*] I gather from your evidence that so far as your opinion of expense is entitled to any weight with this Committee, the Ordnance Survey of Scotland ought to be conducted and completed in conformity with the instructions given in the Treasury Minute, dated the 18th of May 1855, and by Lord Panmure's letter of a subsequent date?—Yes. I might perhaps condense that view of the subject, by saying that I think the survey of the whole of Scotland should be upon the same principle as that upon which we have made the survey of Linlithgowshire, the maps of which have been exhibited to the Committee.

Sir *Roderick Impey Murchison*, called in; and Examined.

Sir *R. I. Murchison.*

584. *Chairman.*] WILL you state to the Committee, generally, the nature of your present employment?—I am Director-General of the Geological Survey of the United Kingdom.

585. I believe you were examined before Lord Elcho's Committee, which sat in the year 1851, on the subject of the Ordnance Survey of Scotland?—I was.

586. Will you have the kindness to state your opinion generally with respect to the survey of Scotland, and inform us whether you have seen any reason to modify any of the opinions which you then expressed?—The interest I have taken for the last twenty-two years in stimulating the Government to accelerate the geographical survey of Scotland, and publish a map of the country, has been placed on record in Parliamentary documents in the year 1836, and was re-stated before the Committee of the House of Commons in 1851. I then contended chiefly for the publication, with as little delay as possible, of a map on a one-inch scale, as being the result most important for the nation, and, above all, as being the largest scale which could be usefully applied to all the mountainous and moorland tracts of Scotland, particularly of the Northern Highlands. At that period, I also gave it as my opinion, that in mining and other tracts in which it was important to mark the outcrop of the strata, a six-inch survey might be very valuable, and I instanced the coal and iron districts of the centre of Scotland as being entitled to such a scale. I was not then, however, in the official position which I now occupy as Director-General of the Geological Survey, nor had any of the field surveyors of that service (with one exception, relative to a very small district) then made use of a map on the six-inch scale with contours, at least, in Great Britain. Recently, however, and during the last year only, as respects Scotland, the local director, Professor Ramsay, and his assistants have been surveying Haddingtonshire and Edinburghshire on the six-inch maps with contours, and have found in them great facilities for the more exact completion of their work. In the first place, as regards coast cliffs, or rocky shores, which so often give the geologist a key to the real frame-work of the adjacent inland tracts, all the physical features are so minutely laid down, that every curve or break of the strata can be accurately noted on the map, as is seen on this sheet, which has been used in the field survey—(*producing a six-inch sheet of part of Haddintgonshire now in progress of being coloured geologically.*)—

Sir *R. I. Murchison.*

10 April 1856.

In the interior of such a country the geologist can insert, in writing, all descriptive lithological details pertaining to every stone-quarry or natural feature; and if he is working in a tract of coal and iron, he can not only delineate the precise outcrops of the respective beds or bands of these minerals, but can also insert on the map itself much valuable local information. Again, the horizontal sections which the Government geologist prepares for publication, having always been made on the six-inch scale, even in all those tracts of England and Wales of which the one-inch map alone exists, it is manifest that he must have a ready-made advantage for his purpose in the six-inch survey map with contours, and specially in having all the approximate heights of the ground given to him, whatever may be the direction in which he makes his transverse section. I would here explain to the Committee, that our usual and published six-inch horizontal sections pass athwart the main direction of the strata; so that each stratum may in succession have its relations expressed, as is seen in these coloured diagrams—(*The Witness exhibited published coloured horizontal sections, which develope the structure of the region around Snowdon, in North Wales; and of parts of the South Welsh coal-fields, as well as vertical sections of coal-pits, and several sheets of the one-inch survey of England and Wales geologically coloured.*)—Now, in possessing a map on the six-inch scale, it is manifest that the inclination of the strata, the direction of which is marked by the arrows, and the angle of that inclination by figures on the six-inch map, are both seen to be in exact concordance with the horizontal section. The greatest, however, of all the advantages which this scale of map confers upon the geological field surveyor (we publish no maps except those on the one-inch scale) is in its contours; for the presence of these lines of relative altitude enables him to draw at once the real outline of the ground; and thus, as in the manner here illustrated, to run his section rapidly—(*exhibiting a horizontal section across a part of Haddingtonshire.*)—If not provided with such contour lines or numerous approximate altitudes, the geological surveyor must himself determine the relative heights, theodolite in hand, accompanied by assistants with the chain, and thus, in fixing geographical data, consume much valuable time, which ought to be applied to the mineral and natural history condition of the sub-soil.—(*The Witness here adverted to the talent, close observation, and great physical powers required in the field geologist, who completed important sections in this manner, andhe instanced a case in which Professor Ramsay had made a section on foot for a distance of* 70 *miles across the mountainous region of North Wales.*)—Whilst with this explanation it is evident that wherever contours are applied to a six-inch survey, the geologist will possess great advantages in his field work, the Committee should recollect that the value of such advantages is strictly relative, and entirely depends upon the geological nature of the country to be explored. Thus, in all those parts of Scotland wherein coal and iron prevail, the publication of the six-inch map seems to me essential. I expressed this opinion with less hesitation to the Committee of 1851, because I was then not so able to form a judgment as I now am. I am still, however, of the opinion which I gave in 1851, and which I have publicly expressed on various occasions from the year 1834, when I first took up the subject, that for all purposes of a military, engineering, or geological nature, a map on a one-inch scale, like that which alone exists as respects Wales, and by far the greater part of England, is fully adequate for the Highlands and Islands of Scotland, or the larger moiety of that kingdom. This conclusion is mainly based on my acquaintance with the sub-soil or rocks of the Highlands, in no part of which is there any formation in which coal or iron of the true carboniferous period exists. On the contrary, the region is chiefly composed of a variety of crystalline rocks, both of stratified and of eruptive characters, and of old red sandstone.—(*The Witness here exhibited a small geological map of the Highlands, prepared by Professor Sedgwick and himself* 27 *years ago.*)—In none of the crystalline rocks have any metalliferous veins been discovered which proved (with very rare exceptions) to be of noticeable value; whilst the old red sandstone, which succeeds to and overlaps such crystalline rocks, is everywhere still more sterile in mineral wealth. All those strata which constitute the coal-fields of the south of Scotland are entirely omitted; and in the Highlands we pass at once from the old red sandstone to the secondary deposits of the age of the lias and oolite. These secondary rocks exist very partially, and on the coasts only, and, though fully explored, they have never been found to contain any amount of coal or other mineral matter worthy of notice.—

(*The*

Sir R. I. Murchison.

10 April 1856.

(*The so-called coal-field of Brora, on the east coast of Sutherland, which the Witness explored and described 28 years ago, was mentioned as by far the most productive of these carbonaceous tracts of the age of the oolites, or like the poor thin coal beds of the eastern moorlands of Yorkshire. It was opened out at considerable expense by the late Duke of Sutherland, and has been long abandoned.*)— In such a country there can be no call for the publication of a six-inch map on geological grounds. In the absence of mineral wealth, and from its mountainous configuration, to say nothing of the climate, it is clear that the great mass of the Highlands can never demand those railroads and canals which traverse the southern portions of the kingdom. On the eastern coast of the Highlands only, where the soil is fertile, and where towns exist, can we hope to see railroads. To those comparatively narrow eastern tracts a larger scale map might also be usefully applied, as respects their statistics and the division of property. But as regards nineteen-twentieths of the Highlands, it seems to me that it would be an useless expenditure of money and time to publish any maps on a larger scale than that of of one inch to a mile. Although we have no precise data to go upon, the statistics of the different counties to the north and west of a diagonal line drawn across the kingdom to the north of Glasgow, Perth, and Aberdeen, are sufficiently known to enable us to say, that somewhere about 9,000,000 acres of that northern region belong to the class of wild moorland, the larger portion of which is destined to be for ever excluded from cultivation; mountainous tracts, which, from the very nature of the soil, elevation, and climate, must ever return the best rents to the proprietors, if continued as pastoral lands, and in many cases affording a still better rental as grouse-shootings and deer forests. Now, if it be decided that maps of such wild and undivided tracts shall be published on the six-inch scale, it is my opinion, from my acquaintance with my native country, that they can be of little use to the proprietors, most of whom would, I feel certain, never think it worth their while to obtain possession of documents necessarily so cumbrous, and who, if they did, would probably put them by as comparatively useless until the real and intelligible geographical map of their extensive properties was to be had upon the one-inch scale. The Committee will, I hope, pardon me when I say that they need require no better illustration of the truth of this inference than the case realised by Sir James Matheson upon his large estate of the Lewes in Ross-shire. Defraying a portion of the expense, that proprietor procured from the Government surveyors a six-inch survey, which was engraved on copper, and published; but as this survey has now been reduced to the one-inch scale as now exhibited, it seems to me obvious that every object which the proprietor could have desired would have been attained if the smaller scale map had alone been published. (*The published Map of the Lewes, on the one-inch scale, but without shading, was here produced.*) It is my hope that the one-inch map of the Lewes, though it is still without hill-shading, may serve as an example to the Highland proprietors. But whilst I express my decided opinion that the publication of a map of the wild parts of the Highlands should be confined to the one-inch scale, I think that in the survey of those regions perhaps even some modified system of contouring of the mountains may beneficially be carried out on the six-inch scale; because I am aware that the Ordnance survey is now trained, under its present able chief, to a fixed and well-digested system of surveying, and that much valuable time would be lost, and vast additional expense incurred, through any sudden change of that system in the field operations. I would therefore recommend that the Ordnance surveyors be left to plot the Highlands on the scale (of six inches) already so largely applied to the south of Scotland, but that these surveys should not be published, but simply retained as Government archives, from which the real or one-inch geographical map would be reduced; it being well to recollect that scarcely one of the great continental kingdoms, all of which already possess maps, have published such on so large a scale even as one inch to a mile. Under such circumstances, the Government geologist might, however, be furnished with a tracing of the larger or archive survey, to expedite his labours, as before explained; and every proprietor who might desire it could, on paying for the same (an improbable hypothesis, in my opinion, as respects the greater portion of the Highlands), obtain a certified copy of the original large map. In suggesting that the survey on the six-inch scale, as distinguished from the published map upon the one-inch scale, should be applied to the uncultivated parts of the Highlands of Scotland, I would beg the Committee to ask the ingenious officer who directs the

Sir *R. I. Murchison.*

10 April 1856.

geographical survey, if it be not possible to arrange a method of delineating the physical features of these wild tracts, by which even the modified system of contouring might, to a great extent, be superseded, a method, in short, which, combining the old system of hill-sketching and measurement of heights with that which now prevails, might materially tend to procure for us the publication of a real geographical map of the Highlands in a reasonable number of years; for, although I have spoken of the great value of contour lines to the geological surveyor, I need not say that in the Highlands, a region not only possessing but very little mineral wealth, but in which scarcely any strata are characterised by their imbedded organic remains, the same detailed sections are not called for which are essential in England and the south of Scotland. In what I have now said, I have made no allusion to the lithographed plans on a scale of 25 inches to the mile, which have been already applied to the cultivated parts of the south of Scotland. In a letter which I addressed to Sir Charles Trevelyan, and which is published in the correspondence of 1854, I was then disposed to think that plans upon a 12-inch scale might have been sufficient for parochial and property purposes; but I did not profess to have any decided opinion on this cadastral point. I am now, however, of opinion, from all I have learnt since I wrote my letter, that the Government has adopted the best scale, or that of 25 inches to the mile, for many economical purposes, such as the settlement of contracts, sales and leases, &c. &c., in arable and cultivated districts. At the same time I do not view these large plans, valuable as they doubtless are for property purposes, as in any way applicable to the great mass of the Highlands of Scotland, of which I wish to see the physical geography laid down and published on the only scale which I consider the maximum size suitable to such ground.—(*The Witness here produced a new map of Sutherlandshire, made at the cost of the Duke of Sutherland, on the scale of half an inch to a mile, and in which the chief physical features are well delineated, with the names of hills, rivers, farms, and villages. He remarked that a one-inch map of this county would be of four times the area of the Duke's map.*)—There is a point, however, in reference to the south of Scotland, to which I still think it right to refer, *i. e.* the desirableness of bringing all the southern counties in that division of the kingdom to the one uniform *published* scale of six inches, from which the one-inch map is to be reduced. I make this observation, because it has been my duty, as Director-general of the Geological Survey, to call the attention of the Treasury to the dilemma in which the geological surveyors have been placed, when in working out their details upon a map of Haddingtonshire upon the six-inch scale, they were suddenly arrested on the borders of Berwickshire, the cultivated parts of which are now alone being executed on the 25-inch scale. As no contour lines, or signs of the material form of the ground, are placed upon the large cadastral plans, or those of the 25-inch scale, they are evidently unserviceable for the reduction to the one-inch map; and hence, looking to the present effective method adopted on the Ordnance survey, it is manifest that the published six-inch survey should be extended to all parts of the south of Scotland which have not yet been favoured with it, but without impeding the rapid publication of the one-inch or general map.

587. Mr. *Lockhart.*] How do you draw the line between the Highlands and the Lowlands?—As respects the Northern Highlands, I should draw the line as it is seen on the little geological map now before me, or as near to it as possible. That line should run a little to the north side of the Clyde; thence to the north of Perth, Cupar, and Aberdeen. It should go diagonally across the country.

588. Lord *Elcho.*] If that line of yours were followed, would it not exclude from the large scale some of the richest corn-growing districts of Scotland, the Morayshire districts, the coast districts of Ross-shire, and of that county to which you have just referred, where, in the neighbourhood of Dunrobin, there are as fine farms and as beautifully cultivated corn districts as there are in any part of Great Britain?—I have already stated, that with respect to the eastern tracts of the Highlands of Scotland, which are rich and cultivated, I would publish a larger scale.

589. The *Lord Advocate.*] Would not your line, as it is marked on the map, exclude the whole of Aberdeenshire, all those fertile straths that run up the rivers in the interior, the large plateau of almost the richest soil in Scotland, from Inverness, along the coast by Elgin, and the whole of Caithness; in what

way

way would you propose to deal with those districts in the survey?—In all those rich agricultural districts I would publish a larger scale.

590. Mr. *Stephenson*.] As a local map?—Yes.

591. The *Lord Advocate*.] You say you do not speak to the 25-inch scale, but if a 25-inch scale would be useful and desirable for the Lowlands in Scotland, it would be equally useful, would it not, for the districts you have mentioned?—Yes; I would give to those rich, low, eastern tracts of the Highlands the same large-scale plan, for property purposes, which is applied to the cultivated districts of the South of Scotland.

592. You stated generally that the whole of Scotland that lies north of a line substantially drawn from the north of the Firth of Tay to the northern point, consists of a geological formation that does not require more than a one-inch scale for all the purposes of geology; that line includes to the north of it a considerable tract of fertile country, which although there may be no governmental necessity for the six-inch scale, would require it as much as the Lowlands?—I have already stated, that whilst I recommended the publication of a one-inch map only for the millions of acres of wild and mountainous Highland tracts, the fertile east coast districts might very beneficially have a larger scale of survey applied to them. Now, whilst I do not consider the 25-inch survey to be a map, and that I know it to be useless for geological purposes (inasmuch as it does not give the outline of the lands, and is much too cumbrous), still, when I view it as a series of cadastral plans, which eminent public men consider to be indispensable for property and other purposes, I can have no hesitation in saying, that the fertile eastern districts of the counties of Aberdeen, Banff, Elgin, Nairn, Inverness, Ross, Sutherland, and Caithness, are quite as much entitled to such a benefit as any portion of the South of Scotland.

593. Mr. *Stirling*.] Do you recommend that over the whole country there should be a publication of the six-inch scale?—Not over the uncultivated Highlands.

594. But as to the other part, you would recommend the six-inch scale?—The rich eastern tracts are, I think, as much entitled to the large or 25-inch scale plans as the cultivated districts of the South of Scotland.

595-6. Did you hear Colonel James's evidence as to the large return that had been made in Ireland from the scale of maps on the large scale?—Yes.

597. Are you aware of the fact, that by the anastatic process the Ordnance Department could furnish 20 copies of any given map on the large scale, as cheaply as they could give one manuscript of it?—Yes.

598. Then of course you would see no objection to the publication to that extent?—If the inhabitants and proprietary of those rich cultivated districts should desire it, their wish should be complied with; for there is no doubt that the quality of their soil entitles them to all the benefits enjoyed by the proprietors of the South of Scotland.

599. Mr. *Denison*.] What is the map on the largest scale with which you are acquainted, that has been published by any foreign government?—The largest scale on which any map of a foreign country has been published is that of Bavaria. It is a lithographed map, on the scale of about one and five-tenths of an inch to the mile. The maps of Austria are on the scale of seven-tenths of an inch to the mile. Those of France on the scale of nearly three-quarters of an inch to the mile. No great European country has published a general engraved map upon so large a scale as the one-inch map of Great Britain.

600. *Chairman*.] Are you at all aware on what scales the surveys of other continental nations have been conducted, and upon which their maps are founded?—No; I cannot answer that question off-hand: I am aware that in France the field or unpublished survey has been conducted on a large scale; I think the scale has been stated to you by Colonel James.

601. The opinions you have been kind enough to give us have been given, have they not, with reference to the geological view of the question?—Chiefly with regard to the mineral structure of the Highlands, because I apprehend that upon such structure all the eventual condition of the country depends. If a country contains neither coal, nor iron, nor minerals of any value, with no towns, and a very thin population, which is the case with all the Western Highlands, I presume you would not apply the same reasoning to it with regard to maps as you would to a highly cultivated and rich country, full of minerals and metals.

Sir *R. I. Murchison.*

10 April 1856.

602. Your evidence, therefore, did not apply to a rich country?—Certainly not.

603. Should you, with respect to important questions connected with conducting a national survey, be inclined to place the very greatest confidence in the gentleman at present employed in conducting the Ordnance Survey of Scotland?—Unquestionably: the greatest confidence.

604. Mr. *Ellice.*] It has been stated before the Committee by successive witnesses, Sir Charles Trevelyan and Colonel James, that there are two objects to be gained by the publication of a map; the object connected with property purposes, and the object connected with geographical purposes; Colonel James has given very distinct evidence, and I think it is also shown in the Blue Book, to the effect that the 25-inch map is, of all that have been before the Committee, the best for property purposes; is that your opinion?—Yes; for I know the opinion of men, whose views I very much respect, such as Henry Warburton and others whom I could mention; I am swayed by their opinions, and I believe that scale to be the best for property purposes.

605. For geographical purposes, you think the one-inch is the best?—I have no doubt about it; I have expressed that opinion repeatedly.

606-9. Mr. *Vernon.*] Would not the six-inch map for the cultivated parts be of great geological advantage from its being contoured; you could not contour on the 25-inch map with any nicety, it being too large for the purpose, and the one-inch map would appear to be too small; would not the six-inch map, therefore, be of advantage to you for geological purposes, being contoured?—There is no doubt about that; I have so stated it already, and I apprehend it is the intention of Colonel James in surveying the Highlands of Scotland to apply the modified system of contouring which he has explained to you; but I am not of opinion that it is necessary to publish upon that six-inch scale.

Sir *John Burgoyne*, called in; and Examined.

Sir *J. Burgoyne.*

610. *Chairman.*] WILL you have the kindness to state to the Committee what office you at present occupy under the Government, and how long you have filled that office?—I have been nine years Inspector-general of Fortifications.

611. During the period you have been in the Ordnance, has your attention been particularly directed to the Ordnance Survey that has been carried on in various parts of the kingdom?—Not very particularly; it has been one branch of my office, and of course I have paid attention to it.

612. Do you recollect that on the 13th June in 1854, in consequence of a circular that had been sent round by the Treasury, a Treasury Minute was made, in which there was a direction to "transmit to Sir John Burgoyne, Mr. Blamire, and Mr. Rendel the replies which have been received to the circular letter from the Treasury, dated the 16th of January last"?—Yes.

613. You, together with Mr. Blamire and Mr. Rendel, were appointed by that Minute a Committee, with instructions to consider the evidence given in the replies to the circular letter, and to state what recommendation you would make to the Treasury founded upon that evidence with regard to the future conduct of the survey of Scotland?—I remember it perfectly.

614. Will you state to the Committee what your opinion is upon that subject?—We were merely required to report on the weight of evidence, and not to give any opinion of our own; and our report, as far as I can recollect it, was, the weight of evidence was in favour of a survey on the 25-inch scale, or twenty-five hundredth, which is nearly the same thing.

615. I believe it was in consequence of your report that the Treasury Minute, dated 18th June 1854, was passed, which instructed the Ordnance to conduct the survey of Scotland upon the scale you there recommended?—Yes, it was.

616. In your opinion is that the proper scale upon which a great national work like a survey of Scotland should be conducted?—I am glad to have an opportunity of explaining that, because my opinion at that time was much in favour of publishing on the six-inch scale, upon seeing the benefits derived from it in Ireland and other parts, and not being then quite aware of the full advantage of the very large scale; but various circumstances have since convinced me that the survey, as a survey, ought to be carried on on a very large scale. Whether you will have it plotted upon that scale or not is a different question; but, having the survey done, and it having been stated that it would be generally

generally useful to so many different interests, public and private, I think it would be quite desirable to plot upon that scale also; for, although it is stated these are private interests, yet they are so diffused and so general, that it becomes of national importance; and I think that a great deal of national wealth will be saved by having a perfect survey on that large scale, and having it plotted on that scale also. Publishing is a different matter. For general purposes you can hardly call it a map, in the general acceptation of the word, where the scale is greater than one inch to a mile. It is a very important survey, and it would be very advantageous that it should be made on a large scale; but it can hardly be called a map, as we commonly understand the word "map." I think that has led to some little confusion. The one-inch map is perfect as a map; if you draw it on the large scale, plot it on that scale, and have means of taking off copies of it by the various operations (and means there are of doing it with great facility and cheapness), it might be turned to the greatest possible advantage, and, if wanted for private purposes, nobody would scruple to pay for it. The expense of obtaining a copy of such portion as might be required would be very moderate, and would save the party requiring it the expense of having a separate survey. The only difficulty, I think, is about the six-inch survey; there has been much difference of opinion as to whether it should be printed, or even made. Now it was turned certainly to great advantage in Ireland. It was a map of general reference on all occasions, by landed proprietors, by travellers, by civil engineers, and many other persons; and having completed the whole of Ireland on that scale, and great part of England, as well as some parts of Scotland, I think it would be better, even though it may not be the very best intermediate scale (for I believe a 12-inch would have been better, or an aliquot part of the one two thousand five hundredth even better still), to make no alteration, but to make the whole uniform; and, taking all circumstances into consideration, I cannot help thinking that the completion of the whole country on the six-inch scale would be very valuable.

617. For the country generally?—Yes, there being so much done already.

618. You stated that as the survey proceeded, you became gradually more and more prepossessed in favour of a larger scale, so that at last you are decidedly in favour of the 25-inch; could you state shortly the grounds on which you came to that opinion?—I have not had a practical use of this map myself very much, except for occasional purposes, but agriculturalists and others tell me that that scale would make a perfect survey of the whole country, and give the required details most minutely; and when you make a survey on the large scale, I apprehend it does not involve much greater increase of labour than if you made it on the smaller scale; and having the materials for the large scale, it would be a great pity not to lay it down on that scale.

619. What I understand you to say is, that you have found by experience that the large survey is acceptable to the public generally, and not to any one class in particular?—I imagine it would be acceptable to the public in general. I can give you a sample as regards my own service. Here is a plan (*exhibiting it*) of Portsmouth fortifications; it is on a scale 200 feet to an inch, virtually much the same thing as the 25-inch scale, that would be 208 feet, and this is 200. This is a very capital plan, and it is drawn on a scale we had adopted ourselves before this great survey was made.

620. This scale is large enough to show every inclosure?—Yes; of course if we want a plan for a small work, we put it on a still larger scale.

621. Have you not lately ordered a large survey of Aldershot, on the 25-inch scale?—Yes; for all military matters, a 25-inch scale would be very valuable.

622. You are aware, are you not, that in making plans upon the 25-inch scale a much larger expenditure would be incurred than would be necessary if a smaller scale were adopted?—I am not aware that it would be so; at least, not in the proportion many persons would imagine; when you come to survey, you must take the same angles, and perform many other operations for a small as would be necessary for a large scale.

623. Do you consider that any additional expenditure that might be occasioned by it would be more than counterbalanced by the advantages which would be derived from the adoption of such a scale?—Yes.

624. I understand you to say that, as far as the Committee would be guided by your opinion, your opinion is decidedly in favour of the scale which is at present carrying on in the Ordnance survey of Scotland?—Yes.

The *Lord Advocate* (a Member of the Committee), called in; and Examined.

The *Lord Advocate*, M. P.

10 April 1856.

625. *Chairman.*] YOUR attention has, I believe, been called during the time you have held the important office you fill, to the Ordnance survey of Scotland?—It has.

626. Do you approve of the Ordnance survey of Scotland, as it is being at present conducted on the large scale under the Treasury Minute of the 18th May 1855?—I think that the only point on which I can with propriety give evidence before this Committee is that which relates to the professional view of the subject in regard to the facilities which would be afforded by the large scale in the transfer of land; that is a subject which attracted my attention a great many years ago. From circumstances, I had occasion to see a map of a portion of America, which was subdivided into parallelograms (a very common practice in that country), each parallelogram being numbered. The cause of my seeing it, was my being engaged in a case relating to the transfer of that property, and it was transferred entirely by the numbers without any description of any kind. It occurred to me at that time, and I have ever since had the feeling very strongly, that conveyancing might be greatly simplified by some principle like that; and accordingly when I saw these 25-inch surveys it struck me, and it strikes me still very forcibly, that they might be made the basis of a system of conveyancing infinitely more simple as well as more secure than anything we have hitherto had. The ground on which I think the 25-inch scale alone would serve that purpose is, as has been explained by the witnesses who have been examined, that it is the smallest scale on which measurements of area can be satisfactorily made; as, indeed, inspection of the maps exhibited of itself shows. If we had the 25-inch scale carried throughout Scotland, it would be the basis of a sure and certain mode of describing boundaries which would be far superior to any written description. At the same time, it is equally plain that for that purpose a lower scale might be equally available for the uncultivated districts; as the boundaries and the features of the country there are so much more extended, they might be shown on a map of a smaller scale. It has been suggested that the changes which take place in the features of the country, or rather the changes in the artificial inclosures of the country in the cultivated districts, would render such a map comparatively useless for such a purpose as that to which I have referred after a lapse of time; but I think it would not be so; because if, for instance, I were going to sell five or six, or 50 or 60 acres, the course to be adopted, if I had the 25-inch scale to work on, would be simply to draw a line round the property I intended to sell as marked upon the 25-inch map; whatever were the changes of the artificial inclosures, that line would, as long as the map lasted, enable you to lay down with the greatest certainty the precise boundary of the property sold. Now in Scotland we have a system of registration, under which every conveyance, to be effectual, must be recorded, and open to the public; every mortgage and every kind of security is recorded. If along with every conveyance there were also recorded a map of the property to which that conveyance related, it would manifestly add very much to the security and distinctness of the records; but in particular it would save one thing (a matter which often occasions great expense and litigation), the descriptions of boundaries in deeds. There are deeds, especially with regard to large estates, in which you see sometimes some 50, 100, or perhaps 200 pages taken up with nothing but description of land. That is not only very expensive, but it is fruitful in litigation, because old descriptions are carried on from one deed to the next, the features of the country having entirely changed in the mean time. According to my notion, it would lay the basis of a much surer system of transfer if we had maps on such a scale that ordinary inclosures could be represented. Any gentleman who examines the six-inch map as compared to the 25-inch, will see that what on the six-inch is impossible, on the 25-inch is plainly and manifestly easy. These are the general grounds on which, professionally, I am in favour of the large scale. It would moreover have this great advantage, that it would record the natural features of the country as they stood at the date of the survey; and it would also enable persons to know what alterations had been made, and within what time.

627. Mr. *L. Davies.*] Would you propose that there should be a counterpart of the map deposited at the time of registration?—I do not think I am in a position to propose that absolutely as a system.

628. But

628. But it would be practicable?— It would be practicable.

629. That would at once prevent, would it not, the possibility of error from the changes made in hedges or other boundaries at the caprice of the purchaser? —It would.

630. *Chairman.*] The large scale would also be peculiarly valuable, would it not, with regard to the Valuation Act and other Acts passed for fiscal purposes in Scotland?—It would be valuable for all purposes that required an accurate survey of the country.

631. Lord *Elcho.*] Taking a general view of this question, as to the large scale, are you of opinion that it is a question which affects landed proprietors alone, or do you think it is a question affecting the whole community?—Being a member of the Committee, perhaps I ought not to prejudge the decision to which I might ultimately come; but as regards the question of conveyancing, I may say that no man can imagine that anything which gives facilities for the transfer of land is not a matter of great public importance.

632. Mr. *Ellice.*] You have referred to the surveys of American lands; are you aware that those surveys were originally State surveys of wild land numbered in blocks, and deposited in the office of the State, which blocks of land were sold without any sub-divisions?—I have no doubt that such is the fact. I should have stated that I have no acquaintance with the American system. I merely alluded to the incident to which I have referred as being the first thing that drew my attention to the subject.

633. Are plans usually appended to deeds conveying property?—I should say not; I should say it was the exception, rather than the rule.

634. It is usual in most cases, is it not, for gentlemen and proprietors of land to have plans or private surveys of their property?—They have in some cases; of course disputed questions only come under my notice generally, but I have known many lawsuits arise out of disputes as to boundaries. I may mention as one instance some old estates in Renfrewshire, as to which a dispute arose some years ago, and it was with the greatest difficulty that we could extricate the question of the marches; that was not a Highland, but a cultivated district; in that case one of the portions of land about which there was a dispute was so undiscoverable, that to this day nobody can identify it: there were three or four plans, none of which agreed.

635. Would anybody dare in a case of that sort to sell or purchase, except by description?— I think not.

636. In such a case as that, would a person be safe in appending a map to the deed of conveyance?— I should say no man would buy unless he knew what he was going to receive from the seller; and if there was a dispute about the boundaries, he would not part with his money until they were accurately ascertained, or making a deduction from the price corresponding to the risk.

637. I want to know whether you would advise any vendor to append a map to the deed of conveyance?—It would depend entirely upon the confidence he had in his own boundaries; but I certainly would not advise a purchaser to purchase, unless the seller was able to give him a clear title to the property he proposed to convey.

638. Do you know many instances in Scotland in which, on property being sold, the map of that property has been appended to the deed?—It is not a common thing in the case of large sales. It is sometimes done as regards smaller subjects.

639. Is it a usual thing?—It is not the usual plan, unquestionably.

640. And is its not being usual to be attributed to the fact, that it is safer to sell without a map?—The system could not be pursued, because there is as yet no authoritative survey.

641. If you have a survey made by the Government, how do you propose to make it authoritative as regards the boundary of any particular property?—You are certain that you have the survey accurate in the first instance; and when once laid down and clearly ascertained, though it may be transferred through a hundred hands, it will remain the same at the end of a hundred years as it is now.

642. Do you believe that the general effect in Scotland would be, that instead of the description of property being inserted in the deed, property would be sold upon the survey that is now proposed to be made?—I have no idea that on the first publication of the new survey descriptions would be dispensed with, but I think

The *Lord Advocate*, M. P.

10 April 1856.

think it is perfectly certain that before the expiration of 10 or 20 years, in a great number of instances, parties would sell by map; I am perfectly satisfied of that; for although conveyancers would, in all probability, keep up descriptions, as lawyers do for greater safety, especially in large estates under ancient titles, yet I think the system would be gradually dispensed with.

643. You have said that in your opinion it would diminish the expenses which are at present incurred in the sale and purchase of land?—I think it would.

644. If it would make any material difference in expense, how comes it that the maps of the proprietors of the property conveyed are not now copied and appended to deeds?—That I cannot answer. My own impression is, that there are very few good estate maps in Scotland; I certainly have never known an instance in which where a question of disputed boundary arose there was a plan that afforded any material assistance.

645. Do you not consider that a property survey made, we will suppose by Mr. Keith Johnston, or any one of the best surveyors in Scotland, would be as good a survey for the purpose of a conveyance of that property as a survey made by the Ordnance?—Of course, if it were made by a competent surveyor, it would be identical with a survey made on this plan; but the fact of its being a Government survey renders it far more authoritative between man and man than a private survey.

646. In what respect does a survey made by a surveyor on a large scale at the private expense of a landowner differ, in point of the security it gives, from a survey made by the Ordnance?—If it were accurately done, it would be the same survey; but the purchaser, before he took Mr. Johnston's survey, would test it by a survey of his own, if he wished to ascertain whether it was accurate or not.

647. Mr. *L. Davies.*] Does not the question resolve itself into this, that where a map is prepared between a purchaser and a seller, that map is only evidence as between those two parties?—Of course.

648. It cannot affect a third party, who is not privy to the transaction; but in the mode proposed of an enlarged map deposited, and representing a large surface of the country, including the property of various proprietors, a sheet taken from that, designating the property, and stating that that property is sold by A. to B., would be public evidence, to all intents and purposes, with regard to the nature and extent of the property sold?—It would, unquestionably.

649. *Chairman.*] Have you any further suggestion to make to the Committee?—It is right to say, that the evidence I have given relates more to what I conceive might become the basis of a much more simple and satisfactory mode of conveyancing than that which is at present in use, than as designating in detail any system I would propose to adopt.

Veneris, 11° *die Aprilis*, 1856.

MEMBERS PRESENT.

Viscount Duncan.	Mr. Leicester Vernon.
Mr. Stirling.	Mr. Dunlop.
The Marquis of Stafford.	Mr. Lockhart.
Mr. Stephenson.	Mr. Smollett.
Mr. Lloyd Davies.	The Lord Advocate.
Mr. Ellice.	Mr. Evelyn Denison.
Mr. Baxter.	

VISCOUNT DUNCAN, IN THE CHAIR.

Lieutenant-Colonel *Robert Kearsley Dawson*, C.B., called in; and further Examined.

Lieut.-Col. *R. K. Dawson*, C. B.

21 April 1856.

650. *Chairman.*] HAVE you any further suggestion to make to the Committee?—There are one or two observations with regard to the scale for the intermediate map, and with reference to contouring, which I would beg to offer to the Committee, being led to believe that they will not be considered unimportant I would state with reference to the intermediate scale, that it is not by

Lieut.-Col. *R. K. Dawson*, C. B.

11 April 1856.

by any means my wish to oppose the adoption of the scale of six inches to a mile, if that should be considered the scale best adapted to the purposes for which such a map is required, namely, geological, geographical, engineering, and property purposes; I cannot separate the property purposes from those for which the intermediate map would be required, and to which it would be specially applicable. The most important of those appear to me to be the property purposes; if it were to be made on a scale sufficient for general property purposes, it would be equally useful for the purposes for which the six-inch map has been recommended, and more useful for other purposes. The replies to the first Treasury circular having settled the scale for the draft plans, the Committee will bear in mind that a further question was conveyed in the circular as to the scale on which the maps should be published. The answers to that question by the public are very decided, and the evidence in the Blue Book is, in my opinion, conclusive in favour of the scale of 12 inches and two-thirds, the opinion of the public having been asked with special reference to the six-inch scale. The question was, What scale should be adopted for the draft plans, and what scale for publication? should it be a six-inch scale or any larger scale? The answer as to the scale for the published plans was, that it should be one-half the scale used for the draft plans. That is the conclusion which was come to. I should state that it had not been contemplated at that time to publish the large map. That is a very important consideration for the Committee; and the merit of that suggestion is entirely due to Colonel James, who suggested that the large-scale map should be published by means of lithography. It had been before held up as a bugbear, and stated that it would occupy an extent of paper which would spread over many acres of ground; but Colonel James has fortunately disposed of that difficulty by suggesting the process of lithography. This decision, however, does not appear to me materially to affect the question, because it was before intended that the public should have access to those large plans. They were to be accessible to the public, as the maps of the Tithe Commissioners are, so that persons requiring copies might obtain them on payment of the mere cost of copying; but the publication of the large maps makes them only more accessible, and Colonel James has shown very satisfactorily, in my opinion, that the cost of publication will be repaid by the sale of the maps. If, then, the Committee should determine to adopt the large scale for publication, I think they will equally be called on to grant the intermediate scale which, in reply to the Treasury circular, is stated to be preferred, namely, a scale half the size of the draft plans. If, after granting that, there should be still a demand for the six-inch map, as it has been shown by Colonel James that the cost of publication would be repaid by the sale, that would appear to me a conclusive argument in favour of granting it.

651. I gather from your evidence, that being in favour of the 25-inch scale as the parent map, you are also in favour of the publication of a map on an intermediate scale between the 25-inch and the 1-inch, and you think that that intermediate scale should be half of the scale of the draft plans?—Yes; and if a further demand be then made for a still smaller map, the expense of publication being repaid by the sale, it would seem to me a strong and conclusive argument in favour of granting that also.

652. I believe that at the time when the Treasury circular was sent round in 1853, the question as to the publication of a 25-inch map had not been submitted to the public?—It was not then contemplated. I did not contemplate it myself.

653. Mr. *Vernon*.] There is no map on the 12-inch scale now, is there?—No general map.

654. Would you approve of having a 12-inch map in lieu of the 25-inch?—Certainly not.

655. Would you have it in lieu of the six-inch, or in addition to the six-inch map?—I would have it, in accordance with the evidence which is collected in the Blue Book, as a scale between the 25-inch and the one-inch.

656. The six-inch scale being already to a certain degree in use, would you throw that scale aside altogether?—I am considering what is really the most useful scale; I look at it professionally rather than politically; I look at it with a view to what is really the best for the country; and whatever may be the present estimation of the value of any work which has now been done, I believe

Lieut.-Col. *R. K. Dawson*, C. B.

11 April 1856.

that hereafter it will be considered very trifling in comparison with the entire cost which will then have been incurred for the work.

657. But having already the six-inch scale in progress, and a certain amount of money having been spent upon that scale, would you be disposed to throw away the six-inch scale entirely, and to substitute in lieu of it the 12-inch scale, or would you be disposed to continue the six-inch scale, as it would partly pay for itself, and have the 12-inch scale in addition?—I cannot conceive that there would be any objection to continuing the six-inch scale if there should be a demand for it, and it can be clearly shown that the expense of publication will be repaid by the sale. My own object will be gained in obtaining the large scale.

658. *Chairman.*] You are aware, I believe, that the survey of six counties in Scotland on the six-inch scale has been very nearly completed?—Yes, and that may furnish an argument with the Committee for completing the rest on that scale.

659. Mr. *Dunlop.*] Apart from the opinion of the public, and without reference to the expense which has been already incurred, but looking merely to the utility of the two scales, which do you hold to be best as an intermediate scale?—The 12 ⅔ inches I conceive to be the best, because that is, to a certain extent, useful for property purposes, for which the six-inch scale is generally admitted to be too small. The 12 ⅔ is the smallest scale which can be used for property purposes.

660. With regard to the opinion of the public, do you feel warranted in assuming that had they known of the facility that will be afforded for getting copies at a cheap rate of the large scale, the same expression in favour of the half scale would have been given?—I should rather state, without reference to what has been done, that I believe the public would decidedly have preferred the scale of 12 inches and two-thirds.

661. Even if they had been aware of the facility that there will be for getting cheap copies of the large scale?—Yes, I think they would still prefer the scale of 12 inches and two-thirds, because it would be applicable to a greater number of purposes.

662. *Chairman.*] Have you any suggestions to make to the Committee with regard to contouring?—I imagined that the question of contouring had been decided by Lord Ellesmere's Commission; and having heard what is now proposed, I may perhaps be allowed to explain briefly to the Committee the course which was taken at that time; the question was advocated by Colonel Larcom, who is stated at page 345 of the Correspondence to be the father of contouring in this country. In that book there is a report by Colonel Larcom in favour of contouring, and another report by myself in opposition to it. At page 349, my arguments are fully stated; and I would wish to refer briefly to them, thus: "Admitting the principle which forms the basis of the system to be theoretically and mathematically true, I apprehend that, in its application to the objects of a national survey, what should properly be desired is, not that which is theoretically and mathematically feasible, but what would be found practically useful, and justifiable in point of expense. It will be found, however, that this perfection of accuracy is attainable only when the principle is carried out in its integrity to the fullest possible extent, and that the cost of the operation would then be perfectly unjustifiable. The most strenuous advocates of the system do not advise this, but recommend the adoption of it only in a modified form, with intervals varying at different stages of elevation. It will be desirable to ascertain, therefore, what claim to accuracy contouring has in this modified form, and what is its cost; what practical benefits are to result from it; and whether practical benefits of a similar nature, and to an equal or sufficient extent, might not be obtained under a different system of procedure at a considerably less cost." Then, after stating that the system of contouring cannot be carried out with rigid accuracy, and that it must be an approximate application of principles only, I say, "If, then, a system of levels is to be adopted which is approximate only and not strictly accurate in its results, it will be well to inquire whether, for those general purposes to which contours in national maps can be applied, a more practical and more economical system cannot be devised; and that which I should recommend for adoption would be a system of levels applying to the natural lines of the ground, viz. the watercourse and water-shed lines, which, in combination with the lines of cliffs and the lines of the sea coast and lakes, constitute

Lieut.-Col. *R. K. Dawson*, C. B.

11 April 1856.

constitute the natural outlines of the ground. These are the lines which, in the application of art to the representation of the human figure, the painter and sculptor would first seek to establish; and these are the lines also which the practical engineer and topographer should equally desire to establish in dealing with the earth's surface." At the bottom of page 351, I say, "The information obtained by it would also be more definite, the points being all found readily upon the ground without measurement, and being such as the practical engineer should receive as sufficient guiding points for his works. The intervening connecting lines, to complete the contours, he would approximate upon the plan, and, when requisite, would trace upon the ground for himself. But the fact is, that he very rarely requires them: the lines of his works are seldom a dead level throughout, but more or less inclined to the horizon, and all that is essentially requisite for him is to be supplied with a certain number of guiding points. If he has to form a communication between two towns on a flat plain he has no need of levels at all; if the plain be evenly inclined throughout, a single level or height at each extremity will be sufficient; if the surface be inclined transversely, and undulating and broken by ravines, he requires to know where to cross the rivers and the spurs. All this information, the levels or heights applying to the natural lines would supply. For the purposes of land drainage, what the engineer chiefly requires is a proper outfall, and for this purpose accurate and well-defined levels along the course of rivers and streams are of paramount importance. The depth of the bed of the watercourse will also be required for his operations at the junctions of streams and at their ultimate outfall; but this he may obtain for himself if a sufficient number of well-defined heights are furnished along their course. The lines of the contours are of use to him only as an indication of the boundary of the area or district to be drained by any particular outfall; he would not desire to carry his drains along the contour lines, and would not trust the contour lines if he did. An approximation to the contour line is all that he really requires, and that he would obtain sufficiently for his purpose from the heights marked along the watercourses and spurs. More specific information he would, under any circumstances, desire to obtain for himself." A map was produced before the Committee yesterday, which was stated to represent the system I advocated in opposition to the system of contouring. I beg to say that that map does not represent what I advocated for the purpose; it was simply used for this one specific purpose. I say of the cost, at page 350, "It has been estimated by the Ordnance at 4 *l.* per square mile for the whole of Scotland on the six-inch scale, and I cannot doubt that on a still larger scale the cost would be very considerably increased. The fact is, that unless it (contouring) be well done it must be practically useless; and if well done, the cost must be very great. A district of 14 square miles in an average sheet (sheet 147, Yorkshire) includes by admeasurement 64 linear miles of instrumental and 454 linear miles of interpolated contours." That map was produced by me to show that the natural lines of the ground would measure only 84 miles; if, therefore, they were actually measured, the cost would be very considerably less. The interpolated contours, as shown upon that map, have, in consequence of my representation, since been abandoned. That is a modification of the system, and now the cost of the system is stated to be 3 *l.* instead of 4 *l.*

663. Mr. *Ellice.*] The interpolated lines were done by the eye, were they not?—No, by the water level, instead of the spirit level. In the system which I suggested there should be no measurements at all, but the leveller, taking the map upon the ground and following the natural lines of streams and ridges, the watercourse and water-shed lines, would set up his staves at definite points previously determined in position by the field survey, and the heights of those points would then at once be determined and recorded upon the map without any fresh measurements whatever. If a sufficient number of those points be given upon the map, along the lines of streams, and upon the intervening high ground, those positive altitudes would supply all the information that is essentially requisite, and would enable any practical engineer to draw approximate contours fully sufficient for his purpose.

664. Mr. *Stephenson.*] You would add, I suppose, to that answer, "along public roads?"—Yes, certainly, but those are, in a great measure, supplied by the Ordnance already; for the geologist additional means would be afforded by the sketches made by the hill-draughtsmen upon the ground; it will be perceived by the maps which were produced before the Committee yesterday, that the lines

Lieut.-Col. *R. K. Dawson*, C. B.

11 April 1856.

drawn by the hill-sketchers are all approximate contour lines, and there would be no difficulty in starting from any one of those lines, and following it along the side of a hill, checking it from time to time by the positive altitudes.

665. Therefore a well-shaded map is an approximation to the most accurate contouring?—Yes; I say at page 353 of the Correspondence on contouring and hill delineation: "As a guide to the hill-sketcher on the ground, the occasional instrumental contours are unnecessary if a proper system of hill-sketching be pursued, and certainly not worth the attendant expense. I state this as the result of my practical experience in Ireland, where the gentlemen employed with me sketched the entire counties of Derry and Antrim, and portions of Down, Armagh, and Tyrone." With reference to a statement at p. 218 of the Blue Book, by Captain Leach, who has now, or had lately, the charge of the contouring department in Ireland, "In considering this subject, it is not to be forgotten that contours form the best possible basis for hill-sketching, whether by contour-sketching on a large or hill-shading on a small scale. It is a curious fact, that Colonel Dawson himself appears to have used contours to check and assist his hill-shading. (See specimens enclosed, which I found among other old documents in this office)." I beg to say that I did not use contours as the basis of my hill-sketching; I merely deduced them from the sketches, when made, to show that the lines which we used in the hill-sketching are practical contours; and from the positive altitudes upon the map, and from the information contained in the hill sketches, such a map as that which was produced yesterday, the Edinburgh sheet, could be produced with all the accuracy that would be essentially necessary for the geologist. I state that distinctly as my opinion. It is a question, then, for the Committee to consider, whether, with the positive altitudes given on the map, in accordance with the decision come to by Lord Ellesmere's Commission, the Committee would think it desirable, for geological purposes alone, to incur the additional expense of 3*l.* per square mile for Scotland, amounting to 90,000*l.*, when all the necessary information can be obtained practically from the positive altitudes on the map, and the information obtained from the hill sketches.

666. *Chairman.*] I collect, from your evidence, that you adhere to the recommendations contained in the Report, dated 15th December 1853, which you sent in, and which is published in the book to which you have referred, namely, the Correspondence on contouring and hill delineation?—I adhere strictly to that.

667. I believe it was not until a period subsequent to that that Colonel James made a recommendation to the Government to publish the map on the 25-inch scale?—It was.

668. Does the knowledge of that fact in any way modify the opinions which you have expressed in the report which you made at that time?—Not the least with reference to contouring.

669. Will you state shortly to the Committee what you apprehend will be the advantages of the system you recommend, as contrasted with the advantages of the system recommended by Colonel James?—The advantage of the system that I recommend consists in supplying positive information to practical engineers, and in giving satisfactory data for any purposes that may be required, at a considerably less cost to the public.

670. Have you considered the comparative expense between the system you recommend and the system recommended by Colonel James?—I have. My calculation is, that the system I recommend would involve only about a sixth of the expense, because there would be no chain measurements; the heights would be applied to objects previously determined in position upon the map, without any chain measurements whatever; whereas the great objection to contours is, that they are lines which have no place upon the ground; it is impossible to discover or trace them upon the ground afterwards without chain measurements, which must involve a very considerable expense; they are not marked upon the ground in any way, so that you never can refer to them afterwards, except by means of chain measurements.

671. Mr. *Vernon.*] Why do you think the contouring only approximate when it is done by a spirit level?—I spoke of the lines determined by means of the hill sketches, and the lines which a civil engineer would trace by means of the positive altitudes as being only approximate contours.

672. What you would prefer is an ordinary line of level, as though for a section, is it not?—Yes, positive heights applied at different points along the course of streams, and along the ridges or natural lines of hills.

673. Putting

673. Putting the expense of contouring at 3 *l.* per mile, what would you put the expenditure at, upon your system, per square mile?—A great part of it is already supplied in the regular course of the survey: lines of level are taken, I believe, along all the principal roads; the additional levels, which would be required along the streams and on the ridges, would probably cost about 10 *s.* a mile, or less; possibly not more than 6 *s.*

Lieut.-Col. *R. K. Dawson*, C. B.

11 April 1856.

674. One of your objections to contouring is the absence of fixed spots; contouring, I believe, is managed by pickets set, not driven into the ground?—It is.

675. Suppose those pickets, instead of being perishable materials like wood, were of a lasting material, and were left in the ground as records, would not that save the expense of subsequent chain measurement?—The expense would be very much greater; instead of 3 *l.*, I am afraid it would be 6 *l.*

676. Mr. *Stephenson.*] The expense of leaving permanent bench marks on the line of contour would depend on the number of marks; it might be 10 *l.* a mile, or even 20 *l.*?—It might; it is not usual to leave such permanent marks.

677. Mr. *Vernon.*] Could there be no mark left at a small expense which would show the distance between line and line?—I am afraid that marks which would remain for any time would be attended with serious additional expense.

Mr. *Thomas Sopwith*, called in; and Examined.

678. Mr. *Stephenson.*] YOU are a Mining Engineer?—I am.

Mr. *T. Sopwith.*

679. And you have been so nearly all your life?—Yes.

680. You are at present chief manager of Mr. Beaumont's lead mines in Northumberland and Durham?—I am.

681. They are very extensive, I believe?—They are.

682. Am I correct in assuming them to be the most extensive lead mines in the world, as one concern?—They are.

683. And the direction of them is entirely under your control?—It is.

684. Have you turned your attention to the scale upon which the adjacent country ought to be laid down in order to give you sufficient mining operation to enable you to conduct the works?—Yes, I have.

685. What has been the result of your experience on that subject?—The result of my experience has been that I have found it, in the first place, of the greatest importance to have a good general map of the country on a scale of an inch to a mile; and in the next place, to have plans on a much larger scale for agricultural and mining purposes.

686. What large scale would you fix upon as the most suitable for the guidance of your under-ground workings?—The under-ground workings are laid down on a scale of 40 feet to an inch.

687. That is how many inches to a mile?—Eleven feet to a mile.

688. That scale is necessary to render your workings intelligible, and to enable you to conduct them with certainty?—Yes; it is the smallest scale on which the details of the workings can be clearly represented.

689. For agricultural purposes, what scale do you conceive would be convenient and intelligible?—I consider a plan of two or three chains to an inch a very useful and suitable plan.

690. *Chairman.*] What is that to a mile?—Forty inches and 26 $\frac{2}{3}$ inches.

691. Mr. *Vernon.*] That is the scale in ordinary use among surveyors, is it not?—Yes.

692. Mr. *Stephenson.*] Bearing in mind that the Ordnance surveys are at present proposed to be published upon three distinct scales, one on a one-inch scale, another on a six-inch scale, and the third on the 25-inch scale to a mile, do you conceive that any advantages would be derived by the public from the publication of maps of the country on so many different scales?—I think that a very great advantage is given to the public by the publication of the one-inch map; but after that I think it is impossible that any scale that could be fixed on would so meet the requirements, under different conditions, as to justify the Government in going to the expense of publishing counties, or the kingdom, on a uniform large scale.

693. So that, in fact, the scale in different parts of the country would depend, in your estimation, upon the nature of the enclosures?—Entirely upon the nature of the property, and the purposes for which the map is required.

Mr. *T. Sopwith.*

11 April 1856.

694. Which of the three scales would you, with reference to your own neighbourhood, choose as being the most convenient and suitable, the 25-inch, the 6-inch, or the 1-inch?—Certainly, for ordinary agricultural purposes the 25-inch scale would be much better than the six-inch, which I consider the least satisfactory scale of all.

695. Are there any purposes to which you could apply the six-inch scale in your neighbourhood with convenience or advantage?—No practical purpose.

696. The one-inch scale is quite sufficient for all practical or geographical purposes, is it not?—I consider it to be so; I would observe that I must not be understood as saying that large maps are of no use, because they are of use; what I mean to say is this, that when the one-inch map is supplied to the public as a uniform map of the country, I think provision ought to be made by the Government, through the instrumentality of the Ordnance survey, for supplying certain materials in a manner which I have suggested in great detail in a letter which I sent to the Treasury, and which would enable the Government, would enable proprietors, and enable map publishers or any other parties, at any time, either now or hereafter, to go on with scales of any magnitude that they might require for their specific purposes.

697. That is, you would have the lines of triangulation made available for the public in any part of the country?—I propose that the lines of triangulation should be laid down either in manuscript or engraved. I do not pretend to give an opinion on a mere matter of detail, but the general principle I advocate very strongly is, that the Government, first completing the inch survey, should after that confine themselves entirely to placing upon record, either as drawings or engravings, a very accurate delineation on a very large and very clear scale of certain principal lines, which would be available to land and mining proprietors at any time, which would be available to the public for sanitary purposes, which would in fact be available for any purpose whatever, and which would also be available for the Government, if they saw fit to proceed either now or hereafter with the large survey; but what I aim at is the acceleration of the one-inch scale for publication, and to supply mining (I speak more particularly of the mining) and other proprietors with materials by which plans should be laid down on a sufficient scale to be useful for practical purposes.

698. I understand you to say that the only things you feel would be of importance, and which might be easily and promptly made available for public use, would be the inch scale throughout the country, and then a very explicit system of lines by which any proprietor of an estate or proprietor of a mine might set himself to work to-morrow to make his own plan on his own scale, to suit his own convenience?—Yes.

699. Have you any further observations to make with regard to the scales of maps?—I should wish to make this observation, that an accurate and well-constructed map upon any scale is undoubtedly a very interesting object, as far it goes; but my observations are confined to the specific point of the great national expense and great delay with which the present system is attended, and which we feel to a very serious extent indeed in the north of England. I was informed lately that the survey of Northumberland was deferred for three years altogether. The survey of the county of Durham is going on at a scale of 25 inches to a mile. I consider that over a very great many hundreds and thousands of square miles the large scale map will be altogether a mere matter of curiosity and interest. It will be a matter of general literary and scientific interest, I admit, but for practical purposes I consider it to be a great waste of the public money.

700. *Chairman.*] Will you state from whom you derive your information that the survey of Northumberland has been suspended for three years?—From the superintendent of the survey in Newcastle-upon-Tyne.

701. Mr. *Stephenson.*] I will now draw your attention, if you please, to the question as to the utility of contouring; I believe you thoroughly understand the operation of contouring?—I do.

702. Confining your attention to your own district, which is a very important one, do you apprehend that if you had had maps supplied to you on a six-inch scale, or upon any scale with contour lines, it would have been of any service to you in your mining operations?—I consider not.

703. You work your mines, I believe, by having watercourses to drive water-wheels and water-engines?—Occasionally.

704. You

704. You have to convey water along the sides of valleys to a very considerable extent, have you not?—Yes.

705. A contour map, therefore, would really present to you upon the slopes of those hills the various levels represented by those lines?—Yes; I repeat what I said before, that it would give a very curious, and, I admit, a very interesting view of the case, and one which I should be very glad to have, as a matter of general interest; but when it comes to a practical point, I will imagine myself to be in possession of a map of that district with contour lines laid down upon it; I will imagine myself beginning to make what I have made within the last few years, about nine miles of water-races, as we call them, or small channels for conveying water along the sides of hills; and I should not know, if I were now beginning the work with the advantage of these contour maps, how to save one penny expense, or one single item of trouble, in setting out and constructing that work.

706. If you had levels at various points well known, across roads, for instance, at a church-door, or any other well-known fixed point throughout the country, would these not afford to you all the information you could possibly require in working out any local sections?—That is all I should require: and I have stated that view very fully in my letter, which I should be glad to refer to, if I may be allowed to do so.

707. Perhaps you will be kind enough to refer to your letter, and read those portions of it which apply to the particular question which I have now put?—This question of levels is very much mixed up with the system which I recommended with regard to the plans. I say, "I propose that in connexion with well-ascertained and permanent stations, derived from what may be considered as the great or trigonometrical survey, certain lines forming the boundaries of triangular or other areas, of from one to ten square miles in extent; these straight boundary lines ought to be surveyed with great care, and include objects within 44 yards on each side. These straight lines embracing a width, say, of 88 yards, might be laid down in draft plans, to be preserved on a scale sufficiently large for any purpose in town or country; as for example, 40 inches to a mile, and being in straight lines of small width, might be registered so as to admit of easy reference. A page of 20 inches square, and on the scale of 40 inches to a mile, or two chains to an inch, would hold five miles of such lines. A reduced index to these, on a scale of, say, four inches to a mile, would admit of 100 miles being very clearly indexed on a sheet of 20 inches square; and this index would present an accurate representation of all roads, fences, rivers, &c. crossing the line, with also, what is of great importance, the exact position of certain fixed altitudes, as at every 20, 50, or 100 feet, which in single straight lines could be levelled and fixed with an accuracy suited for the most extreme exactness of any purpose whatever, now or at any future time. Such contour points, ascertained all over the kingdom, would furnish all that is required for constructing any local maps or sections at any time, and I consider it would be sheer waste of time and money to contour millions of acres, where crags and ravines would oppose almot insurmountable obstacles to accuracy of detail; whereas these carefully ascertained points, on the registered and published lines, would present the rigid exactness of mathematical and engineering data."

708. In your letter you use the word "contour," which I think is hardly applicable to the situation?—Contour points.

709. Are they contour points; are they not rather level points?—They are level points, in fact; but I call them contour points, as indicating the contour or form of the country, and to distinguish them from contour lines.

710. Is there anything special in your other letter upon that point?—"Access to such measured lines would enable parishioners or proprietors to have district surveys on any scale they like; and I am strongly impressed with the belief, that though lines may be laid down with extreme accuracy of detail, both as to surface objects and also levels, yet if large areas of country are delineated with contour lines of level, it must tend to an enormous waste of labour and loss of time, without the accuracy connected with the plan I propose."

711. *Chairman.*] I understand you to say you are a mineral surveyor of some experience?—I am.

712. Mr. *Stephenson.*] Are you also a Crown Commissioner connected with the Office of Woods and Forests in the Forest of Dean?—I was appointed Com-

Mr. *T. Sopwith.*

11 April 1856.

missioner for the Crown under an Act of Parliament passed in 1838, for the arrangements of matters in the Forest of Dean.

713. *Chairman.*] I understand you to say that, with reference to mines, the survey you would commonly use would be a 40-inch survey?—Forty feet to an inch is what I use in the mines which are under my directions, and which are very extensive.

714. For agricultural purposes, what scale do you use?—Three chains to an inch.

715. In a letter which you addressed to the Treasury on the 18th of January 1854, you say, "I have the honour to receive printed inquiries on specified scales of 24 inches per mile for rural districts, of 26 $\frac{2}{3}$ inches per mile for rural districts, and nearly 25 $\frac{1}{3}$ inches per mile for rural districts; and of two scales for town districts, viz., 10 feet per mile, and 10 feet 6 $\frac{2}{3}$ inches per mile. Any of these scales are sufficiently large, and I have in practice always adhered to scales clearly defined by the inch, as of two, three, or four chains to an inch; the latter of which, or 20 inches to a mile, is what I would adopt for any large plan of rural districts"?—Yes, for a large plan of a district, we use condensed maps as well as large working maps; speaking of scales defined by the inch, I give one, two, three, or four chains to the inch; that is the usual practice; and 40 feet to an inch would have been an extension of that.

716. You think that that scale of 20 inches to a mile would be very valuable for the survey of rural districts?—I think it is a very good agricultural scale.

717. As you are a practical surveyor, I need hardly put to you the question; but I suppose I may almost assume as a fact, that supposing the Ordnance survey of Great Britain were conducted on a scale of one-inch to a mile, it would be possible to increase that to 20 inches to a mile without a re-survey?—Certainly not.

718. But if the survey of Great Britain were conducted on the scale of 25 inches to a mile, would it not be possible to reduce the scale of 25 to a scale of 20 inches to a mile at a comparatively small expense?—Yes, that could readily be done.

719. At a comparatively small expense?—Yes; any of those scales are quite suitable, I think, for general purposes in a rural district.

720. Therefore I conclude that under those circumstances you would prefer a scale of 25 inches to a mile, which would enable you to reduce it to one of 20 inches to a mile, to a scale of one inch to a mile, which would require a re-survey before you could obtain a scale of 20 inches to the mile?—Yes; whatever scale approached nearest to the largest scale, of course would be the most useful for the purpose. I go on in that letter to observe, "I consider 11 feet per mile a convenient scale for towns or mines, on account of the relation of 40 feet to one inch, or 10 feet to a quarter of an inch." Then I say, "These scales are well understood by workmen and others accustomed to connect miles and feet with the inch as a standard."

721. I infer, from what you say, that the great advantage of conducting the Government Ordnance survey on a large scale of 25 inches to a mile would be, that it would enable other parties easily to reduce it to other scales, such as would suit their purposes?—I would much rather that the lines were laid down on a much larger scale than 25 inches to the mile; it might be 80 inches or any large scale. I do not mean to lay down dogmatically any particular scale; but I would say, that if a map with skeleton lines were recorded and laid down, with the fences and crossings of roads and the exact level points marked upon those lines, that would be most useful as a public record, and would be available for the Government to make a 20-inch, a 25, or any other scale that might be required; it would enable the Government, or the public, to make their plans of towns, mines, and agricultural districts on any scale which might be most convenient for local purposes. I do not think that any one uniform scale should be adopted; for example, the 25-inch scale would be sufficiently large in some districts, and in many other districts it would be much too small. In Somersetshire, for instance, where the property of the Duchy of Cornwall and the Dean and Chapter of Christchurch is intermixed so much that it is merely divided by ridges in the fields, and where the interlacing of the property is very intricate, a plan on the 25-inch scale would be altogether insufficient. In such a case as that, I would say that the parties having occasion to make plans of the district should

should apply to the Ordnance office for No. 3,022 or No. 2,054, or whatever the number of their triangle might be. All that the Ordnance office would publish would be a sort of cobweb map, as a reference to lines which I would have laid down on a much larger scale than anybody would think of recommending for a general plan of the country. I wish the public to have the advantage of a correct astronomical outline, if I may call it so, giving the exact position of every part of the kingdom, so that at any time a map may be made on any scale that may be required for local purposes; and I would suggest that the parties locally interested should bear part of the expense. I may say, that I have had occasion lately to make very extensive surveys, and a correct outline, such as could only be furnished by a great Government survey, would have been invaluable to me; a map with the skeleton lines upon it would have been invaluable. I think you might as well attempt to make one scale answer both for towns and for country as try to make one scale serve for every part of the country. I think that, if you were to lay down in the barren and mountainous wastes of the northern part of the county of Durham, and great part of Northumberland, plans on a scale of 25 inches to a square mile, they would absolutely be, to a very great extent, useless. I think, also, that the preparation of such plans would be attended with great delay and great inconvenience; whereas, if we had a skeleton on the one-inch, as I have suggested, it would be of immense value for mining and other purposes.

722. Do I understand you to say you think it would be advisable, on the score of correctness, that the skeleton outline you propose should be left in the hands of the Government?—Most unquestionably.

723. With respect to the details, do you not think it desirable, for the same reason, that they should be left in the hands of the Government also?—I think that, in many parts of the country, there might be reasons which would induce the Government to go on filling them up by their own officers; I will suppose those lines to extend over a much greater space than the sketch which I have here represents. It might be the size of this room. These three or four triangles (*referring to a sketch*) might be a district, where, for some purpose, it was desirable that the Government should have the details filled in by their own officers. In many other parts it would answer all the purposes of public utility if it were left to private individuals to fill them in. They could be filled in easily by reference to those exact lines: and for all ordinary purposes I think estate plans would be filled in in that way. It would give great accuracy to local surveys. What I want is, to have some survey finished in the north of England, which we shall never get if we go on with these large scales.

724. Do you not think it would be an advantage to the country to have a large national survey completed by the Government on a uniform plan?—I think not; the one-inch scale I should except, because I have already said that I consider it to be of great use; it is a very convenient scale.

725. You think that the publication of a map on the one-inch scale is attended with advantage?—I think it is attended with great advantage.

726. Do you think it to the advantage of the public that the details of that map should be filled up by the Government?—Most unquestionably.

727. If you think with regard to the one-inch scale that the details may be filled up by the Government with advantage to the public, why are you not of the same opinion with regard to the details of the larger scale?—Because the mere filling up the details on a map of that kind is really a question of very little difficulty, either as regards time or expense, and it would not be an object to any private proprietor to fill up any such detail; he would have no motive for doing so, and unless it were done by the Government it would scarcely be done at all; but there would be a motive for filling up the large scale plans, and for filling them up on the scale best adapted for the particular purposes of each respective locality.

728. Suppose a portion of the country has already been surveyed upon the 25-inch scale, should you or not think it advisable that that uniform scale should be proceeded with, with reference to the rest of the country?—I think not; I would complete what is so far done, certainly; but I am strongly against the continuance of the execution of any map upon one uniform large scale.

729. So I understand that you would recommend the survey of the whole kingdom on a new scale?—No; I would proceed with all that part of the country which is not yet completed upon the plan I have here recommended, and afterwards

Mr. *T. Sopwith.*

11 April 1856.

wards I think it might be very advisable that it should be extended to the rest of the kingdom.

730. Have you formed any estimate with regard to that plan, in a financial point of view?—I have not particularly.

731. You considered the national advantages to be derived from a survey such as you suggest, to be so great that you omitted to take a financial view of the question?—I have not gone into the question of finance. All I can say is, that the preparation of a certain number of skeleton lines would be a very small matter as compared with a finished map of the whole area.

732. Will you have the kindness to refer to the Ordnance map behind you, of the parish of Abercorn, on the 25-inch scale. Having looked at that map, I ask your opinion, as a surveyor, whether you do not think it would be a great advantage to have such a map as that in any survey which you were desired to make of any part of the country?—I should have much preferred, if the Ordnance map had been a map of the district of which I have been speaking, to have had accurate lines laid down on a much larger scale even than that.

733. I understood you to say you were in favour of a map on a scale of 20 inches to a mile, for agricultural districts?—I think it is a very beautiful and satisfactory map for agricultural districts.

734. There is a smaller map below the one you have been looking at, on the one-inch scale?—Yes.

735. That is the scale which you would recommend for general adoption?—Yes.

736. I wish to ask your opinion, as a practical surveyor, on what scale you would conduct a survey, in order to publish an accurate map on the one-inch scale?—I would conduct the survey, as regards the principal lines only, upon a considerably larger scale than that which has been here recommended.

737. On what scale would you conduct it?—I would say, three or four times that scale.

738. On what scale would you recommend the general survey to be conducted, in order to publish a perfectly accurate map on the one-inch scale?—The survey for such a map would probably be plotted to something like eight or ten inches to a mile, and then reduced; that is a mere matter of judgment with the surveyors.

739. You would recommend a survey on a large scale, in the first instance, and then that that scale should be reduced when it came to be published?—If I had to make a one-inch map, I should have the plotting laid down on a scale of eight or ten inches to a mile, and then I would have that reduced, considering that the more accurate mode of proceeding; it would be difficult to work with dimensions on so small a scale as one inch to a mile; but the object I aim at is, that the survey should be confined entirely to a general survey for the purpose of the one-inch map, and that the only large survey at all should be entirely confined to the skeleton lines.

740. I understand you to have said you would wish the survey to be conducted on a large scale, and that that large scale, for the purpose of accuracy, should be reduced to a small one?—In laying down an inch map, I apprehend it is the practice to lay down the plotting on a scale of something like eight or ten inches to a mile; that is what I should do if I had to construct a one-inch map; a survey for the purpose of a one-inch map, is very different from that which is required for a large-scale map; it is totally different in point of detail, time, expense, and everything else.

741. You would keep a copy of the original map, would you not, in order that the public might have facility of access to it, and, if they wished, to make copies of it?—I do not think that the survey which would be made for the purpose of the one-inch map would be useful to the public as a 10-inch map; if a map were to be published on a scale of 10 inches to the mile, the measurements would have to be taken with much greater minuteness and precision than would be necessary for laying down a map on the scale of an inch to a mile. I consider that if the plotting is on a somewhat larger scale, say eight or ten inches, and if you reduce from that to one inch, the original map or plan used for the purpose of that reduction would not be sufficiently accurate to justify the Ordnance surveyors in saying to the public, "Here is a plan of the country on a 10-inch scale;" if it were to be given to the public at all as a 10-inch scale, it must be plotted on a still larger scale, and then reduced.

742. Would

742. Would you propose to publish a map of the mountainous districts on the one-inch scale?—Yes; the inch map I consider one of the most valuable topographical documents ever published in this country.

743. What inch map are you referring to?—The common Ordnance map.

744. If you were surveying for the purpose of a one-inch map, upon what scale would you propose to plot the mountainous districts?—I think 8 or 10 inches to a mile.

745. Mr. *L. Davies.*] You have spoken of the great importance of the one-inch map, and you have spoken, also, of the length of time that would be occupied in getting up a 25-inch map; do you think that the importance to the public of having a one-inch map is so great as to make it advisable for the Government to carry it on with the utmost expedition, and to postpone the 25-inch survey to a future time?—Most unquestionably.

746. You are of opinion, if I have understood your evidence correctly, that the 25-inch survey, even if completed, would not in itself be sufficient to enable you to reduce it to a one-inch map, inasmuch as it would be too large?—No, no map is too large for reduction.

747. You think, then, that a survey made for a 25-inch map would be capable of reduction for a one-inch map?—Unquestionably; a very accurate one-inch map might be made from a map of 25 inches.

748. But still you think that the publication of the one-inch map is a matter of so much importance to the public, that it ought not to be delayed for the purpose of getting up a map on a scale of 25 inches?—Certainly, that is my opinion.

749. The *Lord Advocate.*] We may assume, may we not, that in the evidence you have given you have been speaking with reference chiefly to the mining districts and mining interests?—Yes.

750. I understand that the skeleton map which you propose would be chiefly useful for those purposes?—I think it would be useful in all districts, and for all purposes.

751. Will you tell me whether, in your opinion, the skeleton map, or a map filled up, would be most useful for agricultural and property purposes?—A map filled up, unquestionably.

752. And you think that a scale of 20 inches to the mile would be desirable for agricultural districts?—I think that a map on a scale of 20 inches or 25 inches to a mile, or any scale of that kind, would make a very good agricultural map.

753. A map, I presume, would be more useful for those purposes on the 25-inch scale, with the details filled in, than your skeleton map on a much larger scale?—I think the advantage of a skeleton map would be, that if the estate to be laid down happened to have any circumstances connected with it which required extreme minuteness of detail, it could be so laid down on the skeleton lines, although it could not be done on a map on a smaller scale.

754. Looking to the use of a survey and plan for agricultural property, and public purposes apart from mining interests, which do you think is the best, an outline survey on the large scale you suggest, or a detailed plan on the 25-inch scale?—I should prefer decidedly the publication of the skeleton plans, as they would enable the public at any time and in any place to proceed on any scale whatever.

755. You would prefer it without the details?—Without the details.

756. If you had a survey on the 25-inch scale, and all the materials and calculations on which that survey had been laid down, would there be anything to prevent your constructing a skeleton map on any scale you pleased?—You could not very well construct a skeleton map on a larger scale; you may reduce, but you cannot enlarge with advantage.

757. Why not?—Because a very slight aberration of a pencil or pen is magnified, the effect of manipulation is such that error is increased, and practically it is extremely difficult to enlarge a plan with accuracy; it is very easy to reduce it, because when you reduce, every error, instead of being magnified, becomes less.

758. Do you think that the amount of error between a 25-inch and a 100-inch scale would be so great as to be material in the skeleton map?—I think it would.

759. That is assuming you have error in the copy?—I assume nothing but inevitable error; the expansion of the paper, and so on.

760. It would appear to me that the diminishing process would be as liable

Mr. *T. Sopwith.*

11 April 1856.

to error of that kind as the enlarging process; I can understand that where you have to put in details, you can reduce those details, although you cannot enlarge them?—You can make a much more accurate reduced copy of anything than an enlarged copy.

761. Will you tell me in what respect you think the 25-inch scale has an advantage over the one-inch for agricultural districts?—Because it represents all the fields and divisions of property much more distinctly.

762. You have recommended it, I understand, for agricultural districts; will you tell me what recommendations you think that scale has?—It is a scale very frequently used, and in many cases it is very suitable for representing the dimensions of fields and divisions of property, and it is useful also for other purposes for which plans are made.

763. And you think it desirable for the public interest, do you not, that there should be a scale representing those particulars?—I am entirely against the Government delaying the progress of this great survey for the purpose of completing a survey upon a large scale of the whole area of the country; what I want the public to have, is access to those lines that are constructed with extreme scientific, and I may say, extreme astronomical accuracy, giving the relative position of one part of the kingdom as compared with the other; and what I suggest is, that the public having access to it, the Government or the public could use it at any time, and apply it to any scale or for any purpose.

764. You have stated, that one material element, in your opinion, is the delay which you think would take place in the publication of the maps by making a general survey of the whole area; putting that out of the question, what are the grounds of public interest on which you would recommend the 25-inch scale for the agricultural districts?—I do not recommend the 25-inch scale to be carried out in detail. I advocate merely the publication of an inch map, and the publication of, or allowing the public to have access to, skeleton lines on a much larger scale than 25-inches; say 80 inches.

765. I understood you to say you recommended a 20 or a 25-inch scale?—I gave no preference to a scale of 25 inches, or to a scale of 20 inches. In page 278, I say, "I have the honour to receive printed inquiries on specified scales of 24 inches per mile for rural districts, 26⅔ per mile for rural districts, and nearly 25⅓ inches per mile for rural districts, and of two scales for town districts, viz., 10 feet per mile, and 10 feet 6⅔ inches per mile. Any of these scales are sufficiently large, and I have, in practice, always adhered to scales clearly defined by the inch, as of two, three, or four chains to an inch, the latter of which, or 20 inches to a mile, is what I would adopt for any large plan of rural districts. I consider 11 feet per mile a convenient scale for towns or mines, on account of the relation of 40 feet to one inch, or 10 feet to a quarter of an inch."

766. Why do you think there need be any delay in the publication of such plans or maps as you want, if a general survey of the whole area is undertaken on a uniform scale?—My opinion is, that that general survey will necessarily occupy a very great deal of time. It has occupied a very great deal of time already, and we in the north of England are entirely without maps at present, and I do not see any likelihood of seeing them in my lifetime; therefore I speak feelingly, for I am very strongly impressed with the immense value of these maps.

767. *Chairman.*] Is not the survey proceeding at present in the county of Durham and in the adjacent counties?—In the county of Durham there is a survey proceeding on the scale of 25 inches and two-thirds to a mile.

768. And in the county of York also?—I believe so; I believe, in the county of Durham, the scale of 25 inches and two-thirds has been adopted.

769. Are you aware that a delay took place in the survey of England while the Ordnance was employed in surveying the sister kingdom of Ireland?—Yes; but my observations apply to the inevitable delay which arises naturally from the continuation of the large-scale plan extended over the whole area of the country; I want to get rid of that.

770. I understood you to say that it would be necessary, in order to make an accurate map upon the one-inch scale, to plot on a larger scale than one inch?—Yes.

771. Would not that, upon the same reasoning, occasion delay?—No; if you had the details, such as certain measurements and observations, either by angles or by direct measurement, although the manipulation would be inconvenient to work

work at it with a scale of one inch to a mile, yet with a larger scale it could be done with facility.

772. Has not the delay which has occurred in the north of England been occasioned by no survey being conducted in that part of the kingdom for several years until lately; there has been no survey going on there at all, has there?—No; none in Northumberland. I understood it was deferred.

773. The *Lord Advocate.*] Would you recommend that the survey of the county of Durham should be stopped, and that they should commence again on a different system?—I think that as to those parts which have been already surveyed, the survey should not be rendered useless.

774. *Chairman.*] You would finish the work in hand?—Yes.

775. Is the survey so conducted, that from the materials from which these large maps are made you could construct your skeleton map upon the larger scale?—I consider I could not.

776. Mr. *L. Davies.*] Your chief objection to the 25-inch scale is the delay which it would occasion in the publication of the more valuable map on the scale of one inch?—Yes, I think that is an objection; but I think that if the public could have, in the way described in my first letter, lines laid down 80 inches to a mile, one inch to a chain, or any such scale, that is, if the object of the large survey were confined to the accurate delineation of the objects immediately crossing or adjacent to these principal lines, that would be a more accurate and useful document to give to the public than any one uniform plan, either upon 20 inches, 25 inches, or any such scale of about those dimensions.

777. Suppose a sufficient number of persons to be employed in preparing the larger scale, and to work on the smaller scale, could not both scales go on at the same time?—Yes, if a sufficient number of persons were employed.

778. So that in fact there would be no delay, for the work necessary for the larger scale would be applicable for the production of the smaller scale, provided a sufficient number of persons were employed?—Yes.

779. Mr. *Vernon.*] Are not maps for mining districts on a scale of 40 inches to the mile rather matters for private consideration than for preparation at the national expense?—I consider so.

780. Are not the plans for working mines specially dialled by proprietors for their own use?—Regularly, or they ought to be.

781. Would any public surface map supersede the necessity for dialling?—I consider it would not.

782. In speaking of the triangulation which you propose, has it ever struck you that, considering the large expense of triangulation, if your system were carried out in lines you would have a very expensive affair; that it would be nearly as expensive as a map, if not more so, and yet you would have no map?—I consider that the triangulation of the country is indispensable, with a view to the construction of a large map of the country. All that I propose is, that after that triangulation is fixed upon, the measurements in detail, as a detailed survey, should be confined to these lines, and the immediate neighbourhood of them, avoiding all the intermediate area.

783. I understand you to say you have made no estimate of the comparative expense between the system of a 25-inch map and such a map as you have recommended?—No, I have not gone into the question of expense.

784. You were speaking just now of contours and levels; would you feel yourself justified in forming your flumes or aqueducts for mill purposes without running special levels for your own working purposes?—Certainly not.

785. Mr. *Baxter.*] You have stated that in your opinion a map on the six-inch scale would be of no practical use; do you mean that to apply generally, or only to mining purposes?—I mean generally over the kingdom, as applied to different purposes; I think that, generally speaking, it is too small for most of the purposes for which the agricultural map is required; it is much too small for mining purposes, and too small also for engineering purposes; I have stated that in my letter.

786. You say you have formed no estimate as to the comparative expense of the plans recommended by Colonel James and yourself, but I will ask whether, in your opinion, there would be a considerable saving to the country if your scale of publication were adopted, instead of the plan recommended by Colonel James?—I think it would be a great saving of money to the Government, and a great saving of time to the public.

Mr. *T. Sopwith.*

11 April 1856.

787. *Chairman.*] But in that case all that has hitherto been done would be lost, would it not?—No; I would complete all that has been done or is doing, and I would extend it to what I would call symmetrical forms, without disturbing or disarranging what is in progress; but with regard to those parts of the country where the survey is not yet commenced, I would recommend the plan I have suggested.

788. In that case you would have no uniform map of the country?—I think that no other uniform map than that of the one-inch scale would be of great utility.

789. Mr. *Ellice.*] I understand you to say, that so long as each proprietor has the means, by these skeleton outlines which you recommend, of filling up a good survey of his own estate, there would be no great advantage in having a general agricultural survey of the description proposed?—I think that the skeleton lines I recommend would be most important as a basis in particular districts. I think there are many places as to which the Government would be desirous to say to the Ordnance surveyors this, "See this filled up to a scale of 25 inches;" and with reference to another district, they would say, "Fill this up to a scale of six inches;" whatever was required might be done, either by the Government, or by proprietors, or by map publishers; it would give materials to work upon, and it would exonerate the Government from the burthen and expense of surveying, and particularly contouring hundreds and thousands of square miles, to do which would occupy time and cause great delay.

790. Supposing a uniform agricultural survey were published by the Government upon the scale of 25 inches to the mile, do you not think that instances would be extremely numerous in which proprietors would desire to vary from that scale, and to have a larger survey of their estates; does not the scale that is required for a survey depend very much upon the position and circumstances of the property to be surveyed?—Certainly; for many farms and many estates a map of 25 inches to the mile is a very excellent one; there is no doubt about that; but I do not think that any one uniform scale would be attended with sufficient advantage to justify the Government adopting it.

791. Do you think that a plan on the 25-inch scale would contain a sufficient description for the purpose of a conveyance where the property to be sold did not exceed a quarter of an acre?—Scarcely.

Isambard Kingdon Brunel, Esq., called in; and Examined.

I. K. Brunel, Esq.

792. *Chairman.*] YOU are, as we all know, an engineer of experience and eminence. I believe you were examined before the last Committee of the House of Commons which sat upon the Ordnance survey of Scotland in 1851, and of which Lord Elcho was the Chairman?—I think I was; I have been examined, and have been in communication, either with Committees or public departments, on several occasions with reference to this question.

793. We are very anxious to hear any suggestions which a person of your large experience may be anxious to make upon the subject of the general Ordnance survey of this country, as applicable to Scotland?—I should be very glad, of course, to express any opinion which I thought would be useful, if I knew exactly the points on which anybody wished my opinion; but, as you have been good enough to ask me whether there is anything that I wish to suggest, it really occurs to me that, having for so many years been called on to suggest, and having always found that my suggestions, and those of nearly all my brother practical men, have been followed by adopting exactly the opposite courses to those we recommended, I cannot wish to suggest anything, either to this Committee or to any Government department; but, at the same time, I shall be extremely happy to answer any question that may be put to me.

794. Mr. *Ellice.*] Have you heard the evidence of Mr. Sopwith?—The greater part of it.

795. Do you generally agree with that evidence?—With nearly all that I have heard. I quite agree with Mr. Sopwith, that that which the public generally require, and that which we want for our immediate good, is the one-inch scale. It is very valuable, of course, to have more detailed information, if the Government will undertake it, and furnish it to the public. A scale of 25 inches to the mile is a very excellent scale for a large scale; but considering that or the larger scales, and the various excellent suggestions of Mr. Sopwith, I cannot but feel

that

Mr. *T. Sopwith.*

11 April 1856.

that we are talking about our dinner next week, when in fact we are left without food for to-day, which we are all wanting. During all the time I have been practising my profession, and that is now some years, I have constantly wanted the one-inch scale, and I have found serious inconvenience from not having it in those parts of the country where I have not been able to get it. Very little advance, apparently, has been made in my time, that is, within the last 20 or 30 years, in extending it to the north, and those parts where it is most wanted. I can hardly turn my attention to what would be the relative advantage of the 20 or the 25-inch scale, or to any of those refinements, while I am wanting that which to me, and to a vast number of others, is of infinitely more importance, namely, the one-inch scale.

796. Looking at your evidence given in 1851, that evidence was extremely decisive in opposition to the six-inch scale, and in favour, as you now state, of the immediate prosecution and publication of a map upon the one-inch scale; but unfortunately the vote of that Committee was not given effect to by the Government, and we are now called upon to consider, not a scale of six inches, so much as an enlarged scale of 25 inches; you having been examined on the other Committee with regard to the six-inch scale, we should like now to hear your opinion with regard to the larger scale of 25 inches which has been proposed; it is suggested that it should be omitted in the barren parts of the country, but that generally throughout the country, where the Ordnance map has hitherto been applied, there should be a one-inch map and also a 25-inch map for what is called property purposes?—May I inquire to what purpose the 25-inch map is to be applied? When you say "useful," you mean, I presume, useful to the public. What portion of the public am I to consider?

797. That is rather for you to tell us?—Unfortunately, I am not a landed proprietor; if I were, my views might, perhaps, be different. I do not care much about the 25-inch scale; and if I am to consider that portion, and a very large portion, of the public of which I form one, I really do not care whether you have a 20 or a 25-inch, or anything else, for I feel it would be of no use to me; as a collector of maps, I should have it, but beyond that I should not care about it.

798. In your extensive experience as a civil engineer, would a survey on a 25-inch scale materially aid your operations in either conducting surveys for railways, or canals, or for any other purposes of civil engineering?—I cannot say that any bit of information could ever be useless, and therefore I will not say that such a survey would be entirely useless; but it would be very nearly approaching being utterly useless; and if the Committee think it of any consequence to ascertain whether it is or is not useful for engineering purposes, I would entreat them to take the evidence of, I believe, all the engineers, or very nearly all. We have no interest in preventing the Government from publishing a large-scale map; on the contrary, it is very delightful to have these things, and to have them cheap. We are not, any of us, surveyors professionally; we make no money out of surveys; it is no object to us that we should be employed in making surveys; it is not our business; and therefore the fact of our being, as I believe we are, all of the same opinion, must be tolerably strong evidence that in regard to engineering, the utility or inutility of those large maps must be pretty well ascertained. I believe that, almost without exception, those who have had the most practice in those engineering works which require maps, are of opinion that these large-scale maps are of no use; we do not use them.

799. I presume the opinions which you expressed in 1851 upon the subject of contouring, have not at all altered since that time?—No; but I went into the subject more carefully afterwards. I looked into it with a conscientious desire to reconsider it carefully, and to give an opinion upon it that should be satisfactory, because I was one of a Commission appointed by the Treasury, some year and a half ago, expressly to consider the subject. Lord Wrottesley was the chairman. I had no prejudice against contouring. I went into the thing, and rather advocated it in order to elicit the truth as far as possible; and on that occasion I cordially agreed with the whole (I think we were unanimous) of a rather large Commission, composed of men of science and professional men. We were called in by the Treasury to give them advice upon the subject, and we recorded our opinion. To that opinion I entirely adhere; but after we had taken some trouble, and had been put, as professional men, to some serious inconvenience to attend a Commission sitting at Pall Mall day after day, and had

I. K. Brunel, Esq.

11 April 1856.

gone into the subject with great care, no sooner had Lord Wrottesley made the report and signed it, than, as far as I have seen, everything exactly the reverse has been adopted.

800. Mr. *L. Davies.*] We have been led to believe that, if the map were executed on the 25-inch scale, with contour lines, there would be no difficulty in laying out a line of railway, or in carrying on any other public work, and that the expenditure would be very trifling indeed; is that the case in your opinion?—No; nobody who has had much experience in laying out lines of railway or roads could, I think, say that; I do not think so; and I have had some experience. It is not because I have always used another system that I express this opinion, for I have used contouring. I had some years ago to set out for the Sardinian Government lines of railway, most of which have now been constructed. When I got there, I found that the whole of the district had been most elaborately contoured by Italian engineers, and those were the first maps I had to use in setting out those lines of railway through a difficult country. I assure you I had no prejudice against contouring, but the maps were not ultimately of any use to me, and the whole had to be surveyed over again. I have tried it myself in England, and found it exceedingly expensive, and that it did not give that precise information which I obtained by the other means of levelling.

801. There is a letter here from yourself, Mr. Stephenson, and Mr. Locke, wherein you recommend a 20-inch scale; have you any reason to alter your opinion as there expressed, supposing a large scale to be adopted?—I think it a very good scale. I think 20 inches is enough; and if so, it is needless to give 25; but I have no decided objection to it.

802. Would there not be an advantage in having a 20-inch scale for public and agricultural purposes, for the purpose of affording facilities for the transfer of property, for defining the limits of estates, and so on?—Unfortunately, I have not much experience in that branch of the subject. I do not see the public utility of the 20 or of the 25-inch map. I see private pleasure, comfort, and convenience in it.

803. It has been suggested that in the case of a transfer of property it would be only necessary to refer to a section of the map, which would be at once a complete proof of the limits of the property, and that the transfer might be made on the back of the map?—To a certain extent I think it would be a saving to parties buying and selling property; but, at the same time, no person would, I suspect, be content to buy an estate where the boundaries materially affected the extent or value of the property, without ascertaining the correctness of the map, because changes are continually taking place. With the Ordnance map even on the one-inch scale one gets sometimes into a little scrape; for when you are travelling on a road and think you are going correctly, you find out that a year or two ago the turnpike trustees altered the road. That is one inconvenience of any public recorded maps; they affect a correctness which it is not in the nature of things for them to possess.

804. Do you think that a map on a large scale would possess that correctness which a smaller one would not?—Yes; and that is one of the advantages of having the smaller scale; the advantage is, that it does not affect a correctness which cannot be given to it. To many honourable Members that may seem strange; but I am a practical man, speaking of a matter which I, of course, understand better than most of the members of this Committee; and I beg to state, that by having it on a scale which does not admit of minute details, you at once show the degree of correctness which you are able to give, and do not affect a correctness which you cannot give; the width of roads on small-scale maps are made larger. These small maps are rather indications than correct drawings. To attempt to give actual correctness when you get to a larger scale involves the necessity of giving all the crookedness which you find in hedges, and so on. The correct dimensions of a quarry must be given, if it is given at all; for you cannot put a memorandum on the map saying, "This is only approximately true;" every line that is engraved must be correct, or it should not be there at all; and that is the great difficulty of publishing maps on a large scale where things are constantly liable to change.

805. The *Lord Advocate.*] Is not the amount of accuracy a matter of degree?—I am afraid you cannot put it so easily on the shelf as that. The scales which have been referred to, of 20 and 25 inches, admit of the actual form and dimensions of a hedge being given; the consequence is, that you could no longer draw a line

a line to represent them, but you must frequently have a double line to represent the thickness of the hedge bank, and you must have the crookedness of the hedges shown, because the scale is large enough to admit of it.

806. The same thing might be said of the small scale, might it not; the small scale does not indicate all those small variations which it might indicate?—Excuse me; it is easy on the small scale to arrive at an amount of correctness that is proportionate to the scale. On the large scale you cannot do it, because the cost of it would be something preposterous; if on the 25-inch scale you were to introduce the amount of detail of which that scale is capable, and therefore requires, the map would be perfect, but it would be far too costly.

807. You say, "therefore requires;" why "therefore requires"?—For this reason: a line two or three inches long represents a hedge; you cannot write upon that line, "This is drawn straight, but it may be crooked." You must draw it in some way or other; you draw it straight; that represents a straight hedge; but the hedge is not straight.

808. I quite understand the advantage you have in engineering by having the whole subject under your eye at once reduced with an outline reasonably accurate; but the other ground that you have been illustrating I do not understand, because I do not see why a greater portion of accuracy should be required upon the 25-inch scale than upon the six-inch or the one-inch?—If you think it worth a minute or two, I shall be happy to explain it to you. This scale (*referring to a map*) is large enough to admit the small shoals and islands; you must put them in, or their omission is tantamount to saying there are none. Again, houses become sufficiently large to require that a distinction should be made between a square and an oblong building, otherwise it is described erroneously. If you are going along a road, and want to identify a place by two separate buildings which might be indicated on the map, and find only one, you think you are in a wrong place; whereas in a plan on a small scale, a simple spot would represent the buildings; the consequence of this is, that on a large scale you must have such an amount of detail as is proportionate to the scale, otherwise the map becomes erroneous and misleads, instead of giving information. On a small scale, simple dots do for houses; you could not see the form of them if they were there; therefore you do not expect to find them; you could not measure the width of a road on an inch scale, therefore you do not expect it to be correct. The small map gives you all the information you expect to get from it; but when you come to a large scale, you are only misled if you have not every detail of which the size of the scale admits. The consequence is, that in these large scales an amount of detail is required which is practically useless, because I would just as soon know that the dimensions and forms of those houses were not intended to be correct as to have them correct.

809. That depends very much on what you want to use the map for, does it not?—Just so.

810. Suppose the object I had in using a plan involved the necessity of knowing whether there were islands in that stream or not, which is quite a possible case, I should do better with the large plan than with the small one, should I not?—If I had said anything that threw a doubt upon that, I should have committed an absurdity, and been talking nonsense; but I did not imply that any information could be otherwise than useful; of course it is useful. I was talking of the general utility of it for the public; and I say that the utility of the small scale is so immensely beyond that of the large, that certainly my sole endeavour, looking to the interest of the public, would be to obtain the publication of the small scale. If you were to give us a large scale, with all the details marked upon it, I should be very much obliged to you, no doubt; but in many important cases I could not rely upon it for those very details which alone justify the scale.

811. The small scale, as I understand you, is more useful than the large for those purposes for which the small scale is large enough; but are there no purposes for which the small scale is not large enough?—Private purposes, but not public.

812. Mr. *L. Davies.*] Do you think it impossible that the large scale might be so elaborately and carefully got up as to show in detail every required spot, and where it really stands?—No.

813. Then it is merely a question of expense?—No; not merely a question of expense.

I. K. Brunel, Esq.

11 April 1856.

814. But, at all events, it is possible?—Yes, it is possible.

815. It is possible, for instance, that a crooked hedge can be shown as a crooked hedge, if necessary?—Yes. First of all, I say it is not a mere question of money, because no money will do it within a reasonable time; but there is this inconvenience also to be considered, that you are recording facts which will not be facts five years hence; even these islands and little streams are constantly altering, and so also with regard to farmbuildings and houses, and so on. You record facts which a few years hence will not be facts.

816. The *Lord Advocate.*] May it not be important some years hence to know that such were the facts five years ago?—All knowledge is no doubt of importance; but I cannot think that a minute survey of the whole of the country on a scale of 25 inches to a mile, can, as simply recording all these facts, be productive of any benefit at all proportionate to the cost and time; what I mean is this, that when you attempt a degree of accuracy which cannot be attained, the effect is, unfortunately, only to mislead.

817. Mr. *L. Davies.*] I understood you to say, just now, that the necessary degree of accuracy might be attained?—Practically, I mean.

818. It is not a physical impossibility?—No, it is not a physical impossibility, but the waste of money and of time would be fearful; but, besides that, minute accuracy with regard to roads, and so on, would not only be of very little use, but mischievous; they are constantly being changed, in consequence of inclosures, improvements, and so on; and therefore your recording them as existing roads would be a mischief, rather than a benefit.

Charles Vignoles, Esq., called in; and Examined.

C. Vignoles, Esq.

819. *Chairman.*] YOUR reputation is well known to this Committee, as a practical engineer of the very greatest experience?—I have had a good deal of experience, in various kinds of engineering, in the course of a long life.

820. I suppose your attention, during various parts of your life, has been called to surveying?—Yes.

821. To Government surveying?—Yes; I am perfectly acquainted with all the principles and details on which Government surveys are conducted.

822. Is your experience confined to England only, or does it extend over Europe?—I may say it extends over Europe.

823. Have you any suggestions to offer to the Committee generally, with regard to the Ordnance survey that is at present being conducted by the Government, with reference to Scotland particularly?—It is a subject to which I have paid a good deal of attention. I have given evidence on various occasions, and have written reports; and I was a member, also, with Mr. Brunel, of the Commission which sat upon this subject.

824. The Commission to which you allude is the Commission of which Lord Wrottesley was president?—Yes.

825. It sat in June 1854, I believe?—Yes.

826. Mr. Brunel was one of the members of that Commission?—Yes; and Mr. Gordon, Mr. Rendel, Sir Henry Delabeche, Sir John Burgoyne, Lord Ellesmere, Sir Roderick Murchison, and myself.

827. Did you concur in the recommendation which was made by that Commission, and which is contained in pages 366 and 367 of the correspondence with regard to contouring and hill delineation?—I did; I had a great deal of consultation upon the subject with Sir John Burgoyne, who himself drew up the Report; but we all concurred in it.

828. Are you practically acquainted with the maps which are hanging round this room?—I know them perfectly well.

829. Do you approve generally of the principle upon which the survey of Scotland is being conducted at present by the Government?—Assuming that the Government are following the scale of 1 in 2,500 for the large plans, and that the one-inch plan is to be continued independently of it, I do.

830. Would you approve of an intermediate map between the 25-inch scale and the one-inch?—That would depend, in a great measure, on the circumstances to which the surveys are to be applied. I entered very largely indeed into that question in page 42 of the book you have before you; I discussed it in detail, and it really would be taking up the time of the Committee needlessly, if I were to do more than refer to my letter, which is No. 8, in page 42 of the Correspondence,

Correspondence, and in which I discussed the purposes of a national survey. Assuming the survey of Scotland to be for the purpose of a national survey I have here treated the various scales which might with propriety be adopted, distinguishing the engineering purposes for which smaller scales are sufficient, that is, a scale of one inch and six inches, from statistical purposes, to which, in my opinion, the large survey is more peculiarly applicable, and to which, it was the feeling of the Committee who made that report, it would be applied.

831. I think that that letter of yours was subsequently submitted to Sir John Burgoyne, Mr. Blamire, and Mr. Rendel, the Committee appointed by the Treasury, to whom all the correspondence contained in this book was referred?—Yes; I believe that this and several other letters I wrote about that time, were submitted to them. I had written a previous letter in 1851 to Sir John Burgoyne.

832. In the course of your experience, have you made use of contour maps?—Very often.

833. Will you state to the Committee what is the value you attach to the use of contour maps?—For a preliminary operation I consider them of very great use, and the degree of use they will subsequently be of, will be in exact proportion to their accuracy. The contours of the Grand Duchy of Baden, which I had occasion to use 12 or 14 years ago, I found very useful with reference to the general outline, but when I went into greater detail, they were not so useful; but in Switzerland I found some portions of the contours so accurate, that the line actually levelled, after I had sketched it out, differed scarcely at all from the section produced by plotting from the contour. Good contours, such as these of the Ordnance surveys, I should find exceedingly useful in my preliminary operations. If you can from the contours go to what they call the surface levels, such as are on the six-inch scale, you are able to carry on also a great deal of preparatory operation, with much saving of time and expense; but when we come to execute the work itself, and raise the embankment, and build the bridges, and make the cuttings, we must have our own special surveys for that purpose; therefore the usefulness of contours and surface levels are limited to the preparatory operations of engineering. I have used contours wherever I have found them; but I mention more particularly Baden 12 years ago, and Switzerland only two years ago.

834. Did you find them very useful in a mountainous country like Switzerland?—Around the lakes and in the lower portions of Switzerland; those are the only portions that are contoured.

835. Do you prefer contours to hill-sketching?—The contour gives you a general idea, and I think that from hill-sketching you will get a general idea also; but a contour has this additional advantage, that you are able within a given distance to determine where you should go; these contours are at certain distances, according to the degree of acclivity; when a line of contour is laid down I can count the number of contour lines, and say, to such a place I will go; but I cannot ensure great accuracy, unless the scale is large; and when the scale becomes large, contours cease to be so useful, and you must have recourse to the surface levels. On the Ordnance map in Ireland, on the six-inch scale, I can lay out the general line of a road within 20 or 30 yards, and say to my assistants, "That is the general line; fill up the details;" whereas if I had not the advantage of that map, I must go to much trouble and expense in doing that which I find already arranged to my hand in the six-inch scale with the surface levels. I can get a great deal of preliminary information from the contour map; the utility of it is a question of degree; it is certainly very useful, and it is much used by engineers abroad, where they can get it, as an assistance in their first operations.

836. I presume you think it would be of great public advantage that a survey of the whole country should be conducted by the Government?—I think so; I think we want very much a survey of the whole country, for the reasons I have given in these various documents. I have discussed the purposes to which they should be applied, and the principles on which they should be conducted.

837. You adhere to the opinions contained in your letters?—Yes, I do; and I think that agricultural statistics can never be properly obtained without the basis of these large surveys to go on.

838. Mr. *L. Davies.*] What scale do you recommend?—I have stated my

preference to the 1 in 2,500 as a decimal scale; for, if you take any measure and apply it on a map, whether it be Russian, German, or English, you get the proportion of the map at once; but that is a mere technical refinement, if I may so call it. It is necessary you should have a large map for accurate financial and fiscal purposes. I have here enumerated no less than 18 purposes, grouped for appropriate scales; but you are dealing here with a national survey, which I say ought to be made as generally useful as possible; and it appears to me that the large scale, without pretending to the minute accuracy that an engineer wants when he comes to work, cut, and build, will give a vast deal of information to the public, will be exceedingly useful, and ought to be adopted; but I still agree that the one-inch map ought to be published, which would be more useful, no doubt, to a greater number of persons than those requiring the large scale, what I may call statistical and governmental purposes.

839. I presume that accuracy would be an important ingredient in a great national object such as a survey of the whole country?—Yes; but you can do as they do abroad; after five or ten years, it is true, there will be changes, but these are followed up in other countries; in Bavaria, for instance, all transfers of land are made by their cadastre maps, and whatever alteration in boundaries takes place is entered immediately.

840. The *Lord Advocate.*] How is it done?—There is a general registry in Bavaria, and in that registry is kept a plan of the country on a very large scale, on which every boundary is given; they have not many hedges on the continent.

841. Mr. *Ellice.*] Do you know the scale which they adopt?—I think it is about one in two thousand five hundred. They have not so many boundaries in the shape of hedges abroad as we have here; on the contrary, the lands are very open; but there are boundary stones put, whose precise situations are all perfectly and accurately recorded in the government map, and whenever there is a transfer of land, either by transfer or mortgage, it is entered in the government books.

842. What do you say with reference to these boundary stones?—There is a reference to the plan, on which the property is defined by boundary stones, which are there represented.

843. *Chairman.*] And no practical difficulty is experienced, so far as you are aware, by the transfer of land in Bavaria in that way?—No.

844. Mr. *Ellice.*] These boundaries in Bavaria are determined by straight lines, are they not?—By stones in the ground.

845. But from stone to stone?—Yes.

846. Therefore, that may be taken almost more as a survey than as a map; it is scarcely an analogous case to a plan of an enclosed country?—Whatever there is on the face of the ground is exhibited on the plan.

847. It is an arbitrary line?—No.

848. Is not that something analogous to what Mr. Sopwith proposed, the country being divided into a scheme of triangles, by which any proprietor having certain points determined could make an accurate plan with reference to those points?—Not at all; it is much the same as it is here in London, where parish rates are much contested, and a man puts up a boundary stone to show where the property changes owners.

849. In fact it is a description as well as a map?—Yes.

850. The *Lord Advocate.*] Would there be any difficulty in applying the Bavarian system to a country more enclosed than Bavaria?—None whatever.

851. *Chairman.*] Would there be any difficulty in applying it to Great Britain?—Not the least.

852. Mr. *Ellice.*] I suppose that when transfers of property take place, the boundary stones being altered with reference to those transfers must be registered from time to time upon the state survey?—Very few alterations of the stones take place; but if they are altered, they are re-registered; it is the business of one officer in Bavaria to see that the plans as deposited are kept up *pari passu* with the present state of things.

853. The *Lord Advocate.*] These plans are revised from time to time?—Annually, perhaps.

854. Mr. *Ellice.*] If any property registered in this manner were divided and sold in separate lots, it would be necessary to re-register it?—Yes.

855. Would not that involve the necessity of authorised persons going upon the spot, and making a survey as to the particular portions of land so sold?—No doubt; it is all a question of convenience and degree.

856. The *Lord Advocate.*] Suppose it were the law in this country, as it is in Scotland, that every conveyance and transfer of property should be registered in a public office, would there be the slightest difficulty in registering at the same time the Government plan of the estate or property so conveyed?—Certainly not; that might be done in the same way as the deed is registered.

857. And I presume there would be no difficulty in the same officer who registers deeds, registering the plan also?—By a professional officer for the plans.

858. *Chairman.*] Are you acquainted with the size of the cadastral plans in other parts of Germany besides Bavaria?—Yes; and the cadastre in Switzerland is registered in much the same manner, only more complicated, for every parish, or rather every little commune, has its plan; every stone on the property in each little commune is registered in a book, and the transfers take place upon it.

859. Are you acquainted with the size of the cadastral scales in Austria and Prussia?—No. I think both Bavaria and Baden are on a scale of 1 in 2,500; in fact, that was one reason why I adopted that as a convenient scale; the reason why it was recommended by me was, that it was the nearest scale to three chains to an inch; and the great difference of opinion that arose as to whether it should be 20 or 25 inches to a mile was because 20 inches to a mile happened to give an aliquot proportion of both chains and inches to a mile; but I, who wanted to change the system altogether, and to introduce the decimal principle, preferred that we should say 1 in 2,500, rather than take the odd numbers.

860. I infer from your evidence that if a 25-inch scale map of this country were published, it would be a very great advantage to you as a civil engineer?—I think it would not be so advantageous to me, as a civil engineer, except for Parliamentary purposes, as it would be to the public.

861. And in naming the public, I apprehend you mean all classes of the public?—I mean all classes; and I would particularly wish the Committee to read one or two passages of that letter of mine, in which I state what scale should be applied to each purpose. It is chiefly in page 42. I think, however, that for fiscal purposes, for regulating taxes, for the assessment of various parishes, and for statistical returns, a large scale is important. I do not say it would be so advantageous to an engineer, because the six-inch map and the one-inch map are as much as I should wish; beyond that, I must make special surveys for executing works.

862. Mr. *Baxter.*] I think you were in the room when Mr. Brunel said, that when he was asked to lay out the lines of railway in Sardinia, he found contouring of no use whatever in any stage of the process; does any reason occur to you connected with the nature of that country, or in any other respect, why that should have been so?—Several reasons occur to me; first of all, those contours might not have been sufficiently accurate for the purpose; secondly, it might have so happened that the line had to pass through an extremely narrow valley, in which the limits had to be sought by detailed levelling.

863. Mr. *L. Davies.*] Do you think there would be any advantage in a system of bench marks over the contour?—Yes; I have already stated that I merely take the contour as an addition.

864. Then you would have both?—Yes; the bench marks are indispensable; because if you do not put a bench mark, the contours give you no detailed information, though they give you the general idea.

Robert Stephenson, Esq., a Member of the Committee; Examined.

865. *Chairman.*] HAVE you any suggestions to make to the Committee with regard to the Ordnance survey of Scotland?—Really I feel myself rather in a strait, because I have discussed the thing so frequently with Mr. Sopwith, and it was at my request that he made his appearance before this Committee; we have discussed it for years, and our ideas are so identical, that any evidence I have to give on the subject of the Ordnance survey would be almost a repetition of his. I may perhaps endeavour to clear away one or two points that Mr. Vignoles has referred to with reference to the contours of Switzerland, Germany, and Italy;

R. Stephenson, Esq., M. P.

11 April 1856.

they were referred to also by Mr. Brunel. I laid out a whole system of lines originally in Switzerland, throughout the whole of the Cantons; there was a difference of opinion among the Cantons as to which direction the line should take. I think Mr. Vignoles, Mr. Brunel, and myself, were mentioned as parties in England who should go over there and settle the difference among them. I was the party eventually selected, and I went over, and had the exquisite series of maps put before me which their engineers had prepared of that country; they were contoured, certainly, in some cases most elaborately. I confess, however, that in going over the designs of the engineers, I received little or no assistance from the contour lines, and I may say, fairly, none; because if I had gone over the country, an experienced eye would have given me as much information as to the levels as was necessary; in the preliminary investigation to which Mr. Vignoles has referred, I would as soon trust my eye as I would trust the rough contouring. I quite agree with Mr. Brunel, that an engineer going over a line of country, may feel some interest, with a map in his hand, in referring to the level of the point he is passing over, or to any points that may be within the range of vision; but beyond that, as an engineering benefit I value it very low indeed; exceedingly low; I quite agree with Mr. Brunel there. I cannot deny that the information it conveys may be of some use, but it is so small as to be totally incommensurate, in my opinion, with the cost of obtaining it; and it does not at all serve the ultimate exactness that you must arrive at in order to give a professional opinion, or decide any professional point. With regard to bench marks, I think they ought to be scattered over the country, and the more numerous they are the better; the Ordnance surveyors already have these levels as a matter of course, and if you add to them contours, they would, as far as I am concerned, rather embarrass me than otherwise. I would rather have the range and contour of the country in my own eye or mind, without contoured lines, which, according to my view, produce confusion, instead of giving assistance.

866. The *Lord Advocate.*] You think your own eye as an engineer would guide you fully as well as contour lines would?—And a great deal better, I think; usually speaking, the levels of contour lines are valueless to an engineer, because the features of the country are so marked that he has very little difficulty in selecting the main direction of the line he will take. Mr. Brunel has referred to the Sardinian line going from Genoa to Turin; up to the summit of that ridge it is a mere gorge; they had contoured the two sides of that gorge most elaborately; but when I went over that line, I did not refer to the contour except as a mere matter of curiosity; with regard to the line and the direction or level the railway should be ultimately made on, the contour lines had no more connexion with that than they had with the lines in this country.

867. *Chairman.*] I understand you to say that you concur generally with the suggestions of Mr. Sopwith with regard to the national survey?—Yes; I think that all professional men feel that the Ordnance Department has not done what it might have done with reference to the inch map. I think that they have allowed their attention to be diverted to other matters that are not so immediately pressing as the inch map, and I think also, and have felt strongly that the skeleton map, if supplied within a moderate time, would enable any gentleman in the country to obtain a detailed survey of his own estate, or any neighbourhood or parish might have an exact plan prepared with a knowledge that the basis upon which that plan is made, forms part of the Ordnance survey of the country. Now when a survey is made by a surveyor in the country, he makes an accurate plan of the estate, and gets his areas and every feature of it with great accuracy; but there it ends. Such a survey cannot be made the foundation or form any part of the basis for a combined map of the country.

868. Have you made any estimate of the probable expense of a skeleton map?—No, I have not; but I do not think it is a money question. A skeleton map has been already prepared, and must be prepared by the Ordnance previous to going into the detailed map.

869. Provided we could get such a map as you suggest, you would consider that, considering the advantages to be derived from it, its cost, to a nation like this, would be a matter of comparatively trifling importance?—I do not view it as a money question at all. It is now a matter of time. There is not a man in this room who will be in existence, I believe, when the inch map comes out.

870. Do

870. Do you think it could not be done in eight years?—I am judging of the future by the past.

871. I believe you are aware that it is only within the comparatively short period of a year that Colonel James has been employed as the superintendent of the Ordnance map?—I was not aware of that fact; I know that he has recently come in charge of it.

872. Are you aware that, since that period, greater exertions have been made than were made previously to hasten on the maps of the Ordnance survey?—I have heard so; but of course I know nothing of it of my own knowledge.

873. Are you also aware that, for a great number of years, the Ordnance survey of the northern parts of England and Scotland was suspended, in order that the Royal Engineers might be employed on the Ordnance survey of Ireland?—I believe they were; I do not speak from my own knowledge; but I have heard so.

874. May not that be the reason of the delay that has occurred in completing the one-inch map of England?—I cannot say what have been the causes of the delay; I only know the fact of the delay having been most unreasonable.

875. The *Lord Advocate.*] Do you not think that one cause of the delay may have been the disputes that have arisen upon the subject of the scale upon which the survey should be made?—I do not know what disputes have arisen since those which occurred 10 or 12 years ago.

876. Do you not think that our best mode of getting a map is to agree at last on some scale on which it should be drawn?—No doubt that is necessary, but all practical men were agreed about the one-inch scale; there was no doubt about that; I never heard any one raise a question about it.

877. *Chairman.*] What scale in plotting would you recommend in order to ensure accuracy in the preparation of the inch scale?—Every surveyor might give you a different opinion upon that question; some would plot on the scale of two, some three, and some four inches. Mr. Sopwith, I think, mentioned seven or eight inches. My experience would teach me that the disparity between the plotting and the ultimate scale ought not to be so very great; I think that the plotting ought to be made as near the scale as practicable.

878. Mr. *L. Davies.*] You think that accuracy would be obtained by that means?—Yes. First of all, there is a certain scale, to which you can plot with accuracy; then, with a pentograph, a certain amount of reduction can be made with accuracy. First of all, you depend upon the eye, and then on an instrument; now, if you plot on a very small scale, the eye fails you, and if you plot on a very large scale, the pentograph fails you.

879. *Chairman.*] It is a comparatively easy thing to reduce a 25-inch scale to a scale smaller than itself, is it not?—Certainly.

880. But it is impossible to increase a small scale to a larger one?—It is not so safe. It is undesirable.

881. Mr. *L. Davies.*] Do you think that the 25-inch scale could be reduced to the one-inch?—I think not.

882. *Chairman.*] There must be an intermediate scale between the 25-inch and the one-inch, must there not, in order to ensure accuracy?—I think so; but Colonel James has explained that, and his opinion is worth more than mine with reference to that question.

883. Mr. *Ellice.*] Have you any idea of the saving of expense between a system of triangulation, such as Mr. Sopwith has recommended, and a complete map such as that which hangs up in this room, including all the plotting upon the 25-inch scale, and taking the system of triangulation upon even a larger scale than 25 inches to a mile?—No. It would be very much less. It is necessary that I should explain to the Committee that the expense of triangulation must be incurred in any event.

884. But what, in your opinion, would be the saving after the triangulation was made?—It would be a matter of consideration, and therefore I would rather not state it. I may state, however, that it would be very large. There is no doubt that if the local triangulation were acceptable to the public, it would afford great facilities for obtaining detailed and accurate surveys of any small portion of the country in which any individual might be interested.

885. And that triangulation would give this additional benefit, would it not, that, being made on a much larger scale, it would give you facility for making still larger scales?—Yes.

R. Stephenson, Esq., M. P.

11 April 1856.

886. *Chairman.*] But a triangulation would be necessary in any event?—Yes, that would be the basis of the whole thing; the triangulation, or many portions of it, might have been accessible for 20 years, and the people might have made use of it, but I do not think they have been supplied with that information.

Lieutenant-Colonel *Henry James*, R. E., F. R. S., &c., called in; and further Examined.

Lieut.-Col. *Henry James*, R. E.

887. AS you have been present, and have heard the evidence that has been given before the Committee by the various witnesses who have been examined, since we listened to you, has that evidence suggested any remark that you wish to make to the Committee?—Perhaps it would be better that I should, in the first instance, refer to the point to which Mr. Stephenson has just adverted. The triangulation which I said had been finished was specially stated to be the primary or principal triangulation; I was not allowed to follow up the subject, but I should have been glad to have given the Committee the principal results which have been arrived at. I may state that we have derived, from the measurements of the arcs of meridians in this country and the determination of the exact latitude of many points, the exact figure and dimensions of the earth; and also, from the observations which have been made at Arthur's Seat, Edinburgh, we have determined the mean specific gravity of the earth. That comes out as the great scientific result of our principal triangulation; and I need hardly say to the Members of this Committee, that, as regards the whole system of the universe, the dimensions of the earth is our unit; and therefore we have obtained facts of the very highest possible importance and interest. The triangulation is now perfect, and a synopsis of the principal results will be read next Thursday at the Royal Society. The smaller triangulation proceeds with the detailed survey; for example, we are now triangulating, with small triangles of about three-quarters of a mile, each side, Cumberland, Westmoreland, Lanarkshire, Selkirkshire, and Roxburghshire, so as to complete the survey of the south of Scotland. That triangulation is complete at the present moment, and our surveyors are in those countries. Now, the point to which I should wish to recall the attention of the Committee (and a very important point I think it is), is the actual state of the survey, and the course I recommend, considering the actual state of it, to be pursued. I am not going to say whether in my opinion the six-inch scale was the best scale that could have been selected; that scale was adopted before I had anything to do with the survey. I am not going to say whether in my opinion the 25-inch scale was the best that could have been adopted; the 25-inch scale and the one-inch scale also were adopted before I had anything to do with the survey; but what I do say is, that when we have eight counties actually engraved upon the six-inch scale, and as the six-inch scale is useful and necessary for the uncultivated districts, it is useful for the purpose of the hydrographical survey and the geological survey as well as for other purposes, as it is useful to show the demarcation of every man's property, which must be done if a system of general registration of property is adopted, and as Mr. Sopwith has said, as Mr. Keith Johnston has said, as Mr. Stephenson says, as I say, and as the French throughout the whole survey have said, that even to produce the one-inch map you must have a scale which is very approximate to a six-inch scale, seeing how much has been done upon it, and that it is the proper scale for an intermediate scale between the 25-inch and the one-inch, then I say, having the cultivated districts upon that large scale, you should reduce that portion to the six-inch scale, and have every county complete on one uniform scale. Now, Colonel Dawson has referred to the fact, that when the subject was first discussed, and the question was asked, "What is the scale which you would like the manuscript plan to be upon, and what is the scale you would like for the engraved plan;" the answers were, 25 inches for the manuscript and 12 inches for the engraved. Yes; but Colonel Dawson should have stated at the same time, that the suggestion which I made, and which has been acted upon, of publishing that which was called the manuscript, and which is now the published map on the 25-inch scale, had not at that time been made. After the suggestion had been made to publish the 25-inch scale, the whole proposition was changed, and the question then was, if you have a published map on the scale of 25 inches to the mile, would you also desire to have a

map

Lieut.-Col. *Henry James*, R. E.

11 April 1856.

map on the scale of 12 inches. I took the liberty of referring to a number of gentlemen upon that subject; among others, I may allude to Lord Wrottesley, the President of the Royal Society, and Sir Henry De la Beche, the director of the geological survey; and I have their letters, in which they distinctly say that the problem has changed, and that in their opinion, having the 25-inch scale published, the intermediate scale between that and the one-inch scale should be a scale of six inches to the mile. But besides that, the committee on contouring, to which I referred in my former examination, distinctly admits and recognises that there should be a six-inch map, although they add, "or some other intermediate scale accompanied with contours," and that even upon the one-inch map there should be selected contours. That was a very influential committee, as regards the scientific acquirements of the gentlemen of whom it was composed, to say nothing of their social position; and of course, therefore, great weight ought to be given to their recommendation, which was that a six-inch scale should be adopted for the intermediate scale, and that the maps should be contoured. I conceive that my opinion entirely coincides with the view taken by that commission. Now I am not quite aware whether the skeleton map which Mr. Sopwith proposes, is really intended to be put upon paper. I think not, but that that there will be merely chained lines. Now to produce the one-inch map, Mr. Sopwith says he would plot upon the scale of 10 inches to the mile, that he would have all the lines chained, and that he would have everything put in within 88 feet, I think, of the chained line. The result of that would be that you would, in point of fact, have all the expense of the survey, and finally you would have no survey at all. I grant that if you could have access to those lines, and I see no reason why you should not, anybody could be able to make a plan; but the question is, who would be guided by a plan that any private person made? A plan in which all people would have confidence must be made by parties perfectly independent of local interests. I quite agree that if they had copies of those chained lines, they might use them in the way Mr. Sopwith suggests; but even if they did use them, they would never produce what is required, a national survey for such purposes, as registration, agricultural statistics, and so on. All the expense of a map would be incurred, and finally you would have no map at all.—(Mr. *Sopwith.*) Perhaps the Committee will allow me to say that Colonel James has quite mistaken me, and is referring to that which I said with quite a different object to that which he supposes.—(The *Witness.*) We are both surveyors, and ought not to misunderstand one another. If I understand Mr. Sopwith correctly, we are to establish and chain every line, and to make those chained lines available to the public; that is what you say?—(Mr. *Sopwith.*) No; in referring to the laying down of the survey upon the scale of one inch to a mile, I said, in answer to the question which was put to me, that I would deem it expedient to use a somewhat larger scale in plotting. What I said about giving lines to the public had nothing to do with that part of the question at all. I do not propose to give to the public the chained lines of the survey made for the purpose of the one-inch map, or anything connected with it. The only reference I made to objects being delineated on each side of the line had reference to that specific plan which I proposed, the publishing or making available main lines of triangulation only, or great skeleton lines, and that they should be laid down with the objects 44 feet on each side.

888. The *Lord Advocate* (to Mr. *Sopwith.*)] Will you explain precisely what it is you propose to do, and what it is you propose to make available to the public with regard to these large skeleton lines to which you refer?—These lines (*referring to a drawing*) I would have engraved.

889. On what scale?—On any scale; it would be a mere index to enable the public to know that a certain triangle, numbered so and so, was surrounded by lines which had been accurately surveyed by the Ordnance department.

890. Would you print that?—I would print this skeleton or cobweb map. It would be a mere index map. These lines would be identified by main rivers or roads, or some other objects marked upon them here and there at a distance of a mile or two apart, so as to enable parties at once to identify the place. It would be a public skeleton outline, referring to those lines.—(*The Witness.*) Then the case is worse than I thought it was, because it appears to me, that Mr. Sopwith is going to make a survey for the one-inch scale, independently of the large survey. He will go to all the expense of this triangulation and these chained lines, and leave it to the public to make detailed plans afterwards or not.

Lieut.-Col. *Henry James*, R.E.

11 April 1856.

His plan does not provide for any national survey, beyond a survey upon the one-inch scale.

891. Mr. *Ellice.*] Do you mean to say, after hearing what Mr. Sopwith has stated, that survey by which these triangulations are arrived at, would not serve as a basis for the one-inch map?—Yes. It would serve as a basis for the one-inch map, but Mr. Sopwith does not propose to use it for that purpose.

892. The *Lord Advocate.*] Mr. Sopwith has explained that these triangulations had nothing to do with the one-inch map?—That is what I say. The expense of the skeleton map would be incurred without any beneficial result being obtained.

893. Mr. *Ellice.*] Could you make a triangulation such as that which Mr. Sopwith recommends, the basis of your one-inch map?—That is precisely what we do; I do not approve of the system which Mr. Sopwith advocates, because of the great expense which must be incurred to carry it out, without any adequate result being obtained from it. As regards the point to which Mr. Stephenson has referred, as to larger plans being required for specific purposes, I speak with the most perfect confidence when I say, that the surveys which are now taken have been taken in such detail as to enable you to lay down the plans on a scale ten times larger if you please, or even upon the scale of nature. All the data, therefore, that can possibly be required are in this case available. The triangulation, also, is published; and any one who looks at our maps will see at once that there is a small triangle put on every trigonometrical station, so that the length of those lines can be at once ascertained, and the altitudes are given upon them. I apprehend, therefore, that when we provide a survey in full detail, we provide means whereby the public are enabled to lay down the survey on any larger scale they please.

894. What I understand you to say is, that you would consider that the expense incurred by the adoption of a skeleton map, such as that proposed by Mr. Sopwith, in addition to the expense that would be incurred in making such a survey as would be necessary for a one-inch map, would be an extravagant expense?—I think it would be extremely extravagant, because you would be incurring that expense without reaping the fruit of it.

895. The *Lord Advocate.*] You heard what Mr. Brunel said as to the advantage of the one-inch map over the larger scale; and the view he took that the larger scale was only likely to mislead instead of being useful. Have you any observations to suggest upon that subject?—It is a singular remark, and I cannot comprehend or interpret it.

896. Will you let us know in what respect you differ from him?—That an accurate map, in full detail, should mislead any one, is a thing which I confess I am not able to understand.

897. Mr. *L. Davies.*] Did you understand Mr. Brunel's explanation afterwards, that his remark had reference to the improbability that a plan would be executed which would be so accurate that we could depend upon it, for the expense would be too great; but supposing that expense were gone to, and that an accurate survey were determined to be given, he thought it was quite practicable to make it?—The observation stands apart from the question of expense.

898. The *Lord Advocate.*] You do not understand it?—I do not.

899. Mr. *Ellice.*] Supposing a range of farm buildings were delineated in a certain shape upon that map, and that in the course of the next year that was wholly reformed, and another set of buildings were erected of a totally different shape, would your map of the year before (for that is Mr. Brunel's position) represent the altered circumstances of the case?—A survey can only represent the state and aspect of affairs at the moment when it is taken.

900. Now, a one-inch map merely representing the fact that there were farm buildings there, would not deceive anybody?—The farm buildings, probably, would not be indicated; you may see a dot. I beg to say, with regard to the map of Ireland and the houses there, that we were obliged to sweep away some thousands of them from the surface of our one-inch map; for if we had attempted to represent them, you would have supposed that the map had been peppered.

901. I want to understand why Mr. Brunel's position is not a perfectly good one, namely, that on the 25-inch map you are obliged to delineate with accuracy things as they exist at the time of making the survey, and that the map may next year deceive you, as the exact position of things may have been materially

rially altered?—I cannot conceive how it could deceive you at all; if a house has been pulled down in the interval, you will see that it is gone.

902. How do you see it is gone upon the map?—Supposing a house to be represented on the map, it is represented as a house existing when the map was made; if it is pulled down, the map becomes a record of the fact.

903. I am a stranger, we will say, to the locality; but, looking at the map, should I not suppose that that house was still in existence?—You would suppose the house was there when the survey was made.

904. But if I were to take that map as my text-book, it would lead me to an erroneous inference, would it not?—I think not; it is not as if you had nothing but houses to guide you.

905. *Chairman.*] Supposing you were a stranger to the place, I apprehend that if you wanted to refer to a map at all, you would be more likely to take the more portable, or one-inch map?—Certainly, as a stranger travelling.

906. And therefore you would not be so likely to be misled?—You could not be misled; it is idle to suppose you could be. You would see that a house had been removed; that is all.

907. The great object in publishing a 25-inch map, as far as I understand it, is, that you are able to give objects with greater accuracy and in more detail?—Yes.

908. And, therefore, upon the whole, for most purposes, that map would be more generally useful than the smaller one?—Yes, there is no comparison between them.

909. Mr. *L. Davies.*] Suppose a house to be pulled down and not obliterated from the map, that would not change the general feature and character of the country?—No.

910. The *Lord Advocate.*] I presume that any man of common sense would rather assume that the house had been pulled down than that he had got into the wrong place?—Certainly.

911. In fact, the map would lead you a thousand times right for once that it led you wrong?—Yes.

912. Have you heard certain statements that have been made with regard to the delay in publishing the one-inch map by previous witnesses?—Yes. Your Lordship has suggested to the Committee the principal reason why we have not got a printed map both of Scotland and England, namely, that the whole operation was suspended for years, and that out of these last five years we have lost two, owing to the discussions which have taken place on this subject in different Committees; and I may add, also, that we have lost about 25,000*l.*

913. Since you yourself have had the conduct of the survey, have not repeated instructions been sent to you from the Treasury and the Ordnance to proceed with the one-inch map as quickly as you possibly could?—Such are my instructions at present; and I beg to say that, in accordance with those instructions, the moment we receive the manuscript, we immediately reduce it to the one-inch scale and engrave it; and I have now in this room, for the inspection of the Committee, impressions of all the sheets in Fifeshire, Haddingtonshire, Linlithgowshire, and the other different counties, on the one-inch scale, and also the Irish survey on the one-inch scale; the Committee, therefore, will see that we have *bonâ fide* carried out the orders we have received.

914. And the Ordnance Survey is now proceeding more rapidly than it has done at any other previous period?—Yes.

915. Mr. Sopwith has stated that the survey of Northumberland was suspended for three years; are you practically acquainted with the reason for that delay?—In a great measure the reason for our giving Cumberland and Westmorland precedence over Northumberland in the survey, has really been that we might work up to a parallel, to enable us to bring out the one-inch map which Mr. Stephenson and Mr. Sopwith are so desirous we should bring out; for if you glance at the index of England, you will see that the county of Lancaster runs up between Westmorland and Cumberland, and we cannot bring out the sheets which contain the work which is in Lancashire, because we have not got the work which is in Cumberland and Westmorland.

916. Mr. *Stephenson.*] Is it necessary to bring up your work by parallels; you ought in bringing out your maps to be guided rather by the importance of the counties. Of the coal fields of Durham and Northumberland we have never yet seen anything like a map, and yet you are going on with Westmorland

Lieut.-Col. *Henry James*, R.E.

11 April 1856.

and Cumberland, that being altogether a mountainous country. Is the one-inch really published of the county of Durham?—No, because the sheets are not complete; and with regard to Lancashire, which has been finished two or three years, we cannot publish those sheets, because of Westmorland and Cumberland being on each side. We have engraved part of Lancashire, but have not yet surveyed Westmorland and Cumberland, and consequently the sheets are not complete.

917. I would ask, whether upon the triangulation you have you could not proceed with any individual portion I might put my finger on, independently of any other?—Certainly. The survey of Durham, with the exception of two parishes, for which there were contracts, but the plans of which were inaccurate, and which I had to reject, is finished and plotted, and in part published, and there (*pointing it out*) is one of the large plans.

918. Is a map of the whole county of Durham available to the public on the one-inch scale?—No.

919. Then am I to understand you as saying that one of the reasons why the county of Durham is not available to the public is, that some portion of Westmorland and Cumberland requires your attention?—No, that is not the reason. The county referred to was Northumberland; it was suggested that we had given precedence to Westmorland and Cumberland rather than Northumberland, and I stated that wishing to work up to a parallel, and to be enabled to publish Lancashire on the one-inch scale, we gave precedence to Westmorland and Cumberland.

920. You have published the map of Kendal, I think?—Yes.

921. Comparing the importance of that district, which is very mountainous, with the importance of Durham and Northumberland, especially the coal fields, do you think that it ought to have had precedence over the other?—No, not viewing it in that light; and if gentlemen would not press us so dreadfully for the one-inch map, it would not have had precedence.

922. I am not blaming you individually, but the former proceedings of the Ordnance department to which you now belong. I know you have very recently come into your present position, and have not yet been able to redeem past errors. If you were now forming an opinion with reference to the counties that ought to be published on the one-inch scale as soon as possible, would you think that the counties of Durham and Northumberland should take precedence over those of Westmorland and Cumberland, or not?—Certainly they should, because the plans of those counties would be more valuable than plans of the mountainous and non-mineral districts of Cumberland and Westmorland.

923. *Chairman.*] Is it not the fact, that you have been directed by the Ordnance to proceed regularly with the survey of the northern districts of the kingdom?—Yes; I have explained that we cannot publish the one-inch sheets of Lancashire without completing that portion of Cumberland and Westmorland which will be in the same sheet.

924. But I understand you to say that you have no desire to neglect the mineral districts, but that your anxiety is to publish these various maps upon the one-inch scale as speedily as possible?—My orders are to do so, and I entirely concur in the propriety of those orders.

925. And you are at present proceeding as actively as possible, in compliance with the orders received from the Ordnance department, to publish the one-inch map as speedily as possible?—Yes.

926. Mr. *Vernon.*] Would not Mr. Brunel's observation with reference to alterations which might be made in the face of the country after the publication of the large scale map, impairing its accuracy, be applicable, more or less, to every published map, be the scale what it may?—Certainly.

927. Mr. *Baxter.*] You have heard Mr. Sopwith state that in his opinion the six-inch scale would be of no practical use whatever, either generally or for mining purposes; is it consistent with your knowledge that the six-inch maps which have already been published have been purchased by practical men for various engineering and other purposes?—Not only do I think that they will be useful, but we had the map of South Wales, as was stated by Sir Roderick Murchison, expressly drawn upon that scale, so as to include the mineral districts of South Wales.

928. Is it consistent with your knowledge that those maps have been purchased by practical men for such purposes, and that they have been made use of

by

by them?—We have the experience and the opinion of all the distinguished geologists to whom I referred before, Professors Ramsey, Harkness, and Jukes, and the opinions also of Sir Henry De la Beche and Sir Roderick Murchison, that they are necessary for geological purposes, and therefore necessary for laying down mineral districts. I have myself, as a geologist, laid down lines of different copper and lead lodes upon them, and I know their value.

929. You heard Mr. Sopwith state that he had made no particular estimate of the comparative expense of his plan and that of Colonel James; I wish to ask whether you have made any such estimate, or whether you can give us any opinion upon the subject?—The plan proposed by Mr. Sopwith contains not only a small triangulation, and the chaining of every one of the sides of that triangulation, but levelling, with the levels recorded on fixed objects; and I am quite satisfied that when the expense of so much work has been incurred, you will have incurred probably seven-eighths of the entire expense of making the survey: to complete the survey, having all the data in your hands, is a very simple matter and very inexpensive, and therefore I should think it an extremely injudicious outlay of money to incur all that expense without having the result desired, namely, a map on a scale useful and fit for property purposes.

930. You do not think there would be any great saving of expense to the public by adopting that plan?—Certainly not.

931. *Chairman.*] On the contrary, you think, do you not, that more expensive than the plan you propose?—I do not say that the same amount of money would be expended, but you would have no survey at all; that is what I object to.

932. Have you any further suggestions to make to the Committee?—Several questions were put yesterday when the Lord Advocate was under examination as to registration, and it appears to me, though it would sound rather curious at first in courts of law, that the description of property in deeds might always be by latitudes and longitudes, with reference to these maps; we engrave the latitude and longitude on the margin to seconds: you could take them off to tenths of seconds. Nothing could be easier, however irregular the form, or however large or small the property, than to say its most northern part was in such a latitude, and its most southern part in such a latitude, and its western and eastern parts in such a longitude. By that means the exact position of the property would be absolutely tied. This could be done by any lawyer's clerk merely drawing the lines through the marginal graduations, so that whatever lapse of time might occur, and whatever changes might be made, it would be utterly impossible that the identification of that property could be disturbed; there would be no other place for it on the face of the earth. Mr. De la Rue seeing the map of Aldershott (which is here) on my table, when he paid us a visit, asked me, "Have you got my house upon this map?" I told him I had no idea that he had a house in that neighbourhood. He said, "I have not only a house, but I have determined its latitude and longitude to a fraction of a second." I said, "Then we will soon ascertain how far we agree." We drew the lines through the marginal graduations, and I have his note here in which he says we agree to half a second. I should observe that Mr. De la Rue is himself the secretary of the Astronomical Society, and a very skilful practical astronomer. With regard to agricultural statistics, I may be allowed to say, not only that I entirely agree with what Mr. Vignoles has stated, but that I submitted a plan to the Committee of the House of Lords upon that subject, which was not adopted, as it would be impossible to carry it out without the aid of maps; but with the aid of maps, I no hesitation in saying that by using the simple machinery of parish schoolmasters, you would obtain accurate statistics at a very trifling cost; there would be no question whose the property was, how much belonged to this man and how much to that; there would be no jealousy as to the operation; parties would never know when the information for the agricultural statistics was being taken, because the schoolmaster would have nothing more to do than, in taking his walk in the evening or in the morning, to see what crop was growing in certain fields, and that he might, of course, do, without reference either to owner or tenant. I am quite sure that very correct agricultural statistics could be collected in that way, with the aid of accurate maps, and books of reference such as we are now publishing; and that this may be done very economically and very quietly by parishes.

933. Have you any further suggestion to make to the Committee?—I should be glad to be permitted to refer to an expression which tended rather to mislead

Lieut.-Col. *Henry James*, R. E.

11 April 1856.

people. In page 68 of Mr. Hall Maxwell's evidence before the Committee of the House of Lords, he says, "With regard to a suggestion of Colonel James the other day, I wish to state that his plan, I think, originated with myself, in a communication with Lord Elcho"?—That appeared to me so remarkable a statement, that I asked Mr. Hall Maxwell about it, and he wrote me a note, which I have here, in which he says, "As to originality of idea, my meaning was misunderstood: I meant to say, that so far as the Highland Society was concerned, the matter was first mooted in a communication of mine to Lord Elcho;" which has a very different meaning.

934. Mr. *Ellice.*] You promised to let me have an account of the cost of the survey since the Committee of 1851?—I have here the grants for each year.

935. But the grants do not exactly represent what has been laid out?—It is impossible that I could give you that information without reference to the books, which are at Southampton.

936. I want to know, in round numbers, without any great accuracy, how much of the expense that has been incurred since 1851 you think might have been avoided if the report of the Committee of that year had been carried out, and the one-inch scale alone had been proceeded with?—In compliance with the request you before made, I have made that estimate with Captain Cameron, as well as we could do it here without reference to our books, which are at Southampton. We find, that since 1851 we have drawn, in Haddington, 280 square miles, in Fife and Kinross 586 miles, and Linlithgow 100 miles; making together 966 square miles, which have been drawn and engraved upon the six-inch scale. The expenditure upon that has been 24,150 *l.* Then the same quantity of ground, if done upon the one-inch scale only, would have been 8,050 *l.*; so that in that district on which we have laid down the work upon the six-inch scale, the difference is 16,100 *l.* We have since then drawn in Ayrshire 1,016 square miles, in Renfrewshire 234, Dumfriesshire 1,129, Peebles 354, and Berwick 242; making 2,975 square miles in those counties, which have been all surveyed.

937. Upon what scale?—Upon the 25-inch scale. The expenditure upon that has been 59,500 *l.*, but the same quantity of ground upon the one-inch scale would have been 17,850 *l.*, making a difference of 41,650 *l.*; so that on the whole it makes a difference of 57,750 *l.*

938. *Chairman.*] In how many years?—Since 1851. But I should state, that in this very period we lost 5,000 *l.* in consequence of the suspension of the six-inch survey, and our undertaking the one-inch; the whole of the one-inch work was thrown away; and, as I stated before, we were stopped altogether in our proceedings for 15 months; the loss of money arising from that was at least 20,000 *l.*, so that we have lost 25,000 *l.* and about two years, since 1851; and that may be taken as a type of the extraordinary manner in which the Ordnance survey has, from period to period, been interrupted, and time and money wasted.

939. Mr. *Ellice.*] Is that loss beyond the expenditure you have just given us?—They are independent things.

940. *Chairman.*] I understand you to say that that loss has been occasioned by the frequent delays that have been interposed in making the survey?—Yes.

941. Mr. *Stephenson.*] Will you explain how the suspension of the survey can have caused so much loss, because all the data will be equally available, will they not, when you resume the survey?—I am very glad you have put that question. On the survey we have a great subdivision of labour; our surveyors are not draughtsmen or computers, nor are the draftsmen or computers surveyors; the consequence is, that on the survey, when it is properly organised, the quantity that is surveyed is drawn and computed by other persons immediately afterwards; but we were without orders for 15 months as to what scale we were to draw the plans upon; the consequence was, that there was on the 11th August 1854, when I took charge of the survey, an accumulation of 867,000 acres surveyed, not one of which was drawn; but the draftsmen and computers were idle whilst this great accumulation was going on.

LIST OF APPENDIX.

Appendix, No. 1.

Memorial of the Directors of the Highland and Agricultural Society of Scotland - p. 116

Treasury Minute, dated 16 April 1839 - p. 117

Appendix, No. 2.

Lieutenant-Colonel James to the Inspector General of Fortifications, recommending that the Plans on the One Two-thousand-Five-hundreth Scale shall be reduced to the Six-inch Scale, to make the Survey of the Cultivated Districts on the One Two-thousand-Five-hundredth Scale uniform with the Counties already published, and with the Plans of the Highlands and Uncultivated Districts, ordered to be drawn on the Six-inch Scale; and that the Boundaries of Properties should be shown on the Ordnance Plans - p. 118

Letter from G. C. Mundy, Esq., to the Assistant Secretary, Treasury - p. 119

Letter from H. R. Drewry to Sir Charles E. Trevelyan, K. C. B. - p. 120

Lieutenant-Colonel James to the Inspector-General of Fortifications, reporting with reference to the Information required by the Treasury Minute of the 16th July 1854 - p. 120

Extracts from Communications from Contractors for the Survey of Parishes - p. 122

Appendix, No. 3.

Papers referred to by Lieutenant Colonel James, R. E., in his Evidence, 10th April 1856:

Letter from Mr. Josiah Parkes, to Captain J. Cameron, R. E., dated 30th August 1855 - p. 122

Letter from Messrs. Park, Son, & Garlick, dated 8th September 1855 - p. 124

Appendix, No. 4.

Expenditure upon Surveys of Great Britain and Ireland, up to 31st March 1856 - p. 124

Appendix, No. 5.

Approximate Estimate of the Cost of the Surveys and Plans made for the undermentioned general purposes, to which a National Government Survey and Maps, drawn to the Scales of $\frac{1}{500}$ for Towns, and $\frac{1}{2500}$ for Rural Districts, would be applicable - p. 125

APPENDIX.

Appendix, No. 1.

Appendix, No. 1. MEMORIAL of the Directors of the Highland and Agricultural Society of *Scotland.*

Unto the Right Honourable the Lords Commissioners of Her Majesty's Treasury.

The MEMORIAL of the Directors of the Highland and Agricultural Society of Scotland,

Sheweth,

THAT your memorialists, about 18 months ago, addressed to your Lordships a memorial expressing the satisfaction with which they had learned, by an official communication from your Lordships, that the triangulation of Scotland would be immediately commenced, preparatory to the resumption of the Scotch trigonometrical survey. Your memorialists understand that the triangulation was accordingly commenced in the north of Scotland last summer; and they trust, as they have every reason to hope, that the officers employed in that national work will resume their operations early in the present season.

The object of the memorial which is now respectfully submitted to your Lordships, is in regard to the nature of the maps to be constructed under the Scotch trigonometrical survey, and more especially the scale on which they are to be drawn. Your memorialists do not know that any decision has yet been come to on this matter, which is of much importance with reference to the practical utility of the survey; and they feel encouraged by the reception which their former memorials met with, to make known to your Lordships the views and wishes entertained by the Highland and Agricultural Society of Scotland on this point.

In regard to the objects which it would be desirable to have represented on the maps, your memorialists would take the liberty of referring to the memorial which they addressed to your Lordships in July 1837, where these are detailed. They may now state generally, that they think the maps would not afford the information necessary to the full exhibition of all the geographical features of the country, unless there were represented on them:

1st. The physical outlines of the country in respect of mountains, vallies, rivers, lakes, &c.

2d. Marks to indicate what parts of the country are cultivated, what parts are waste, and what parts are covered with woods or plantations.

3d. The positions and names of towns, villages, harbours, churches, and other prominent buildings.

4th. The position of roads (including turnpike, parish, and servitude roads), canals, railroads, ferries, collieries, limekilns, &c.

5th. The boundaries of counties, parishes, and burghs, including under the last head Royal and Parliamentary burghs, as also burghs of regality and barony.

6th. The heights or altitudes above the sea, of the mountains and hills whether isolated or in groups and ranges, as well as the heights or altitudes above the sea of the river courses and water-shed lines, for every quarter of a mile.

These are the objects which your memorialists are humbly of opinion ought to be represented or delineated on the maps to be constructed under the Scotch trigonometrical survey; and if there are on the maps of the English and Irish surveys any other points besides those now enumerated, your memorialists trust that they also may be put on the Scotch maps.

With regard to the scale of the maps, your memorialists are inclined to suggest that there should be a general map for the whole of Scotland (uniform with the map of England), on a scale of one inch to the mile, and that there ought to be a special survey of the manufacturing and mining districts, and those parts of the country which are highly cultivated or improvable, on a scale of six inches to the mile, similar to the Irish survey.

Your memorialists have only further to repeat the hope expressed and explained by them in their last memorial, that the general geological features of the country may likewise

wise be exhibited on the maps. They have seen what has been done in this respect in England and in Ireland for the trigonometrical survey of these countries, and they are anxious that similar information should be afforded by the Scotch trigonometrical survey. This branch of the survey will be attended with far less expense than it has occasioned in England and Ireland, for two reasons. The first reason is, that a general geological map has already been constructed of Scotland at the expense of Government, which, though in many respects very inaccurate, will greatly facilitate the perfect execution of the work. The second reason is, that the Highland and Agricultural Society, of which your memorialists are directors, have for some years been offering premiums for geological reports and surveys, and they have already obtained reports and surveys, illustrated by collections of minerals and maps coloured in detail of five or six counties, as well as of several important mining districts, all of which reports and surveys shall be at the disposal of the officers employed on this branch of the Scotch survey.

Your memorialists may perhaps be permitted to suggest, that it may be expedient to introduce into Parliament a short Act applicable to the Scotch trigonometrical survey, giving, on the one hand, to the officers employed on it a right to enter on any lands for the purposes of the survey, and to the proprietors or occupants, on the other, a right of being indemnified for any damage in consequence sustained by them. In this Act there should be power given to the officers of the survey to call on heritors, magistrates of burghs, and other proper parties, to point out the known boundaries of parishes, counties, and burghs respectively, or to appoint qualified persons to do so, in order that these respective boundaries may be correctly laid down on the maps.

These suggestions your memorialists submit to your Lordships' consideration with much diffidence, knowing that there are others far better qualified than they are to decide on such matters, whom your Lordships will probably consult. But they have been induced to make known to your Lordships the views and opinions that have occurred to them, in consequence of learning through his Grace the Duke of Sutherland, the President of the Highland and Agricultural Society, that there would be no indisposition on the part of your Lordships to listen to any suggestions which the directors of this society might wish to make on the subject.

(signed) *Montrose*,
Vice President.

Highland and Agricultural Society's Hall,
Edinburgh, 22 March 1839.

TREASURY MINUTE, dated 16 April 1839.

My Lords read a memorial from the Directors of the Highland Society of Scotland, expressing their satisfaction that my Lords had directed the Ordnance to proceed with the triangulation of Scotland for the purposes of the trigonometrical survey of that part of the United Kingdom, and stating the expediency of executing, in addition to the general map similar to the Ordnance Map of England, an enlarged survey on the scale of six inches to the mile, for the manufacturing and mining districts, and those parts of the country which are highly cultivated or improvable, adopting the principle laid down for the regulation of the Irish survey.

My Lords read the Report of the Select Committee of the House of Commons on which the Irish survey was founded, and observe that the larger scale seems to have been recommended and adopted with a view to the boundaries of townlands and the general valuation of territory in that country, objects not contemplated in the English and the Scotch surveys.

My Lords apprehend that the adoption of this principle, more especially under the very undefined description of the districts to which it may be applicable, contained in the memorial before them, may lead to very great increase of expense and to delay. It may also lead to an expectation of a resurvey, on the same principles, of districts already surveyed and engraved.

They are unwilling also to give any direction that would render it necessary to increase the present strength of the topographical corps, considering the number of men and of officers who will be placed at the disposal of the Ordnance when the Irish survey is completed.

They reserve their final determination, however, for the period when they shall be favoured with the Report of the Master-general and Board of Ordnance on this subject.

Write to the Master-general and Board of Ordnance in the terms of this Minute, transmitting to them the memorial of the Highland Society, and requesting to know their opinion with respect to the suggestions it contains, and more especially requesting to know generally what increase of expense or what delay might be the consequence of adopting the suggestions made by the Highland Society.

Appendix, No. 2.

Appendix, No. 2.

Lieutenant-Colonel *James* to the Inspector-General of Fortifications, recommending that the Plans on the One Two-thousand-Five-hundreth Scale shall be reduced to the Six-inch Scale, to make the Survey of the Cultivated Districts on the One Two-thousand-Five-hundredth Scale uniform with the Counties already published, and with the Plans of the Highlands and Uncultivated Districts, ordered to be drawn on the Six-inch Scale; and that the Boundaries of Properties should be shown on the Ordnance Plans.

Ordnance Map Office, Southampton,
Sir, 30 June 1855.

1. After a very careful consideration of the orders contained in the Treasury Minute of the 18th May last, relative to the scales upon which the plans of Scotland are to be drawn, I trust to be pardoned, if whilst I state my conviction that their Lordships have adopted the most judicious course as regards the MS. plans, and my entire concurrence in that portion of the Minute which directs that the cultivated districts shall be drawn upon the one two-thousand-five-hundredth scale, and that the Highland and partially cultivated districts shall be drawn on the scale of six inches to a mile, if I still earnestly recommend that the plans on the one two-thousand-five-hundredth scale shall be reduced to and engraved on the six-inch scale, so as to make the survey of every county perfect on that scale.

2. Considering the purposes for which the national survey is required, it is of the first importance to be able to represent every property upon one connected map; and knowing through what extensive districts different parishes, properties, and farms contain portions of cultivated and portions of uncultivated ground, and that if we have a different scale for the cultivated from that for the uncultivated, we shall have no perfect plans of either the parishes, properties, or farms, &c. so circumstanced, I feel certain that this will cause the greatest possible inconvenience, and make it almost impossible to use the plans for such purposes as the registration of the sales of property. So again where we have cultivated districts along certain parts of the coast, and uncultivated districts in other parts, we shall have no continuous survey of the coast, nor continuous maps through the country for engineering, geological, and many other purposes for which maps on a uniform scale intermediate between the 25-inch and the 1-inch are required. The plans on the one two-thousand-five-hundredth scale, except for reference for acres, are as much too large as the one-inch scale is too small for such and many other purposes.

3. The plans on the one two-thousand-five-hundredth scale, which were originally intended only to be kept in manuscript, enable us to obtain the exact areas of all the inclosures, and to put a reference number to the "Table of Areas" on each separate cottage or garden, and hence are essentially necessary for such purposes as the registration and valuation of property; but the number of sheets to be put together, even for the purpose of making up the plans of a single parish, are so numerous in most instances as to make the plans inconveniently large and extremely unwieldy. We require the information to be obtained from these plans, but we require to have it condensed, for all general purposes, into a smaller and more convenient size, even to the smallest upon which everything can be properly represented to scale; and this we know from experience is the scale of six inches to a mile.

4. I recommended, that by the aid of lithography or the anastatic, or any other inexpensive process, copies of the plans on the one two-thousand-five-hundredth scale should be made and sold to the public at a cost which should cover the entire cost of making them, because I feel certain that for very many public, as well as local and private purposes, they will be found most valuable; but I never contemplated the abandonment of the publication of the six-inch plans, for I entirely concur in the recommendation of the Committee, composed of—

The Earl of Ellesmere,	I. K. Brunel, Esq.,
Lord Wrottesley,	J. M. Rendel, Esq.,
Sir John F. Burgoyne,	C. Vignoles, Esq., and
Sir R. Murchison,	Professor Gordon,
Sir H. De la Beche,	

"That in those districts to which the large scale of 24 or 26 inches to a mile is already applied, it would be most desirable that a reduction should be made and published on the six-inch, or some intermediate scale between the large plans and the one-inch map." *See* page 366, "Correspondence on the Survey."

5. Lord Eglintoun, in a recent debate in the House of Lords on the scales for the survey, dwelt very forcibly on the inconvenience which would result from having no uniform scale; and when it is considered that we have already published six counties in Scotland and the Island of Lewis on the six-inch scale, and that we are to draw the plans of the uncultivated districts, supposed to be more than one-half of the remainder, on the same scale,

scale, and that the reduction of the plans on the one two-thousand-five-hundredth scale can be made at no very great additional cost, and that this would render the whole scheme for the survey perfect for every purpose, I trust the Lords of the Treasury may be induced to give the additional orders required to make the instructions for the survey complete.

6. If, on the publication of the plans of each county, the boundary of each separate property in land and houses could be authoritatively determined and indicated on the plans, the immediate and prospective advantage to be derived from it would be of immense importance to the public; its accomplishment would form an era in the history of the country, like that which marks the period of the Doomsday Book, and the Down Survey in Ireland; succeeding generations would refer to the national survey as to an authentic record of the extent of each property at this period, a record, however, which from the greater perfection of the Ordnance survey and its preservation on copper, and in the immense number of copies which are preserved in our public offices and sold with the official stamp on them, would be infinitely more perfect and more imperishable than any former record.

7. With the series of maps which I have recommended, the boundaries could be marked with little difficulty, and at a trifling cost, for although from the grossly defective character of the original instructions for the survey of Ireland (originally ordered to a mere skeleton map), a separate and very expensive department was obliged to be created to mark the boundaries of the townlands to be surveyed, we now with the perfect plans in our hands, showing every fence, stream, drain, &c. in the country, should have no difficulty in marking the extent of every property.

8. In illustration of my evidence before the Committee of the House of Lords on Agricultural Statistics, which is now sitting, I produced the plans of two parishes, Glencross, in Edinburghshire, and Aberlady, in Haddingtonshire, on which I have marked the extent of each separate property in those parishes; I therefore speak from experience as to these facts.

9. An Act of Parliament similar to that for the Boundary Department in Ireland would be required to enable the Government to effect this object, and the counties should probably be called upon to pay the expense of demarking the boundaries of the properties, as these plans would immediately become the basis for the valuation and local taxation of the counties; and there is no greater want at this moment in the different counties of Scotland than such plans as I have described.

In making these suggestions I do not for a moment contemplate any investigation into the titles of property, though with a proper system of registration based on authentic plans, the titles also would be gradually established.

From the great importance of this question it might well have been made the subject of a separate communication to the Government, but I especially refer in this letter to this application of the survey to show how important it is that the scales of the original plans, and the series of maps to be produced from them, should be such as to enable the Government to carry out such measures as I have described, and this I am confident can be done if the additional order I have suggested be given.

I have, &c.

(signed) *Henry James*,
Lieut.-Colonel Royal Engineers.

Submitted to Lord Panmure for recommendation to the Treasury, if his Lordship approves.

The measure appears to be one of great utility.

With reference to par. 6, it will be for their Lordships to decide upon the proper authority under which such boundaries should be decisively fixed.

(signed) *J. F. B.*

9 July 1855.

LETTER from *G. C. Mundy*, Esq., to the Assistant Secretary, Treasury.

Sir, War Department, 1 August 1855.

I am directed by Lord Panmure to request that you will submit for the favourable consideration of the Lords Commissioners of the Treasury the enclosed communication from Lieutenant-colonel James, Royal Engineers, on the subject of the scale to be adopted for the publication of the Trigonometrical Survey of Scotland. Lord Panmure concurs in the arguments brought forward to show, that, however necessary it may be to delineate a portion of the country upon the scale of one two-thousand-five-hundred, such enlarged map

Appendix, No. 2.

should not supersede the production of a map from the same survey on the scale of six inches to one mile for the same districts, uniformly with those parts of the country which are laid down on the smaller scale only. Independently of the advantage of having one uniform scale for the whole of Scotland, the difficulty of drawing a line between the districts to be laid down on the partial scale of one two-thousand-five-hundred and on the scale of six inches to one mile, appear to Lord Panmure to be great; and his Lordship is of opinion that no part of the districts surveyed on the 25-inch scale should be engraved or lithographed until the sense of Parliament is expressed as to an extension of that scale beyond its present experimental limits; but that Lieutenant-colonel James should be authorised to engrave and publish maps reduced to the six-inch scale for those districts.

I am to request the return of the enclosures.

I am, &c.
(signed) *G. C. Mundy.*

LETTER from *H. R. Drewry* to Sir *Charles E. Trevelyan*, K. C. B.

War Department, Pall Mall,
27 Feb. 1856, 244-1/9.

Sir,

With reference to the conclusion of the Treasury Minute, dated 24th July 1854, respecting the preparation of the plans of Ayrshire and Dumfriesshire,

I have the honour, by desire of the Secretary of State for War, to transmit to you, for the information of the Lords Commissioners of Her Majesty's Treasury, the copy of a report from Lieutenant-colonel James, R. E., superintendent of the surveys, dated 4th instant, containing the particulars required by their Lordships' Minute.

I have, &c.
(signed) *H. R. Drewry.*

Lieut.-Colonel *James* to the Inspector-General of Fortifications, reporting with reference to the Information required by the Treasury Minute of the 16th July 1854.

Ordnance Map Office, Southampton,
4 February 1856.

Sir,

By the Treasury Minute of the 16th July 1854, the plans of Ayrshire and Dumfriesshire, and of the other districts in which the survey is proceeding, are ordered to be drawn on the one two-thousand-five-hundredth scale, but previous to sanctioning the large scale as a general measure, their Lordships direct:

1st. That the increased cost of the plans on the one two-thousand-five-hundredth scale above the cost of the plans on the six-inch scale be ascertained by actual experiment;

2d. That the system of piece-work within the department; and

3d. The system of independent contracts with other surveyors, should be tried, and the relative cost of the survey of each of the above methods be reported to their Lordships.

In my letter of the 15th August 1854, I stated in detail the course I proposed to follow to carry their Lordships' orders into effect, and I have now the honour to report the result.

1st. As regards the comparative cost of the plans on the one two-thousand-five-hundredth scale, and plans on the six-inch scale, I find that the cost of the MS. plan on the one two-thousand-five-hundreth scale = 12 *d.* per acre; six-inch scale = 9 ¼ *d.* per acre; but I find that the actual cost of the plans on the one two-thousand-five-hundreth scale is decreasing each quarter, and I fully anticipate that their cost will shortly be reduced to 11 *d.* per acre.

This diminution in the cost is produced by our introducing mechanical means for the purpose of expediting the drawing the large plans, and by the draftsmen becoming familiar with the new scale.

I did not consider it advisable to have the surveys paid for by the two systems of piece-work and daily pay simultaneously, as I feared this would produce dissatisfaction amongst those employed, if not something like a conspiracy to defeat the object we had in view; I therefore allowed the work to proceed in the first instance on the old system of daily pay, and found that the cost was 17 *d.* per acre; but this was for work done during the quarters ending December 1854 and March 1855; that is, during the worst season of the year for progress, and when we had to correct errors in the measurements of that great arrear of 867,000 acres surveyed, but not drawn, no orders having been issued as to the scale on which the plans were to be drawn, and to which I referred in my letter of the 15th August 1854.

The system of piece-work was introduced at the beginning of June quarter; and the cost at first was 14 *d.* per acre; but from the causes I have mentioned, this cost was reduced in September quarter last to 12 *d.* per acre; the cost of the two systems cannot therefore be

be said to be correctly represented by the above figures; the difference in the seasons must be first taken into account, the difficulty of so rapidly instructing upwards of 2,000 men in working on the new scale in the prescribed manner, and the want of those mechanical means which we have gradually introduced, and which would have cheapened the work paid for by daily pay in the same proportion as it has that done by piece-work.

But making these allowances, the relative cost may be fairly stated as follows: by daily pay the cost will be 13*d.* per acre; and by piece-work, 12*d.* per acre; and, as I said before, I confidently expect to reduce this cost still further.

2d. As regards the system of piece-work within the department, I am therefore clearly of opinion that it can be advantageously adopted; the actual present cost is diminished by it; and by the stimulus to exertion which it gives, and the extra quantity of work which is done, the ultimate effect will be that the survey will be done in a less time, and the great cost of superintendence, office rent, and other expenses attendant on a vast establishment, proportionally lessened. I have tried the experiment on almost every branch of the work, and in all the counties in progress, and the result is highly favourable to the system.

3d. The result of the trial of the system of independent contracts is unsatisfactory. I have accepted tenders for the survey of 172,456 acres in the following counties: Ayr, Dumfries, Renfrew, Peebles, and Durham. The average cost of these plans will be, as nearly as possible, 12*d.* per acre. The plans, therefore, which we can accept as sufficiently accurate and well drawn, are, at the rates paid for them, quite as expensive as the plans drawn in the department; but it will be seen from the extracts from the contractors' letters, which I enclose, that the contractors would not undertake the same work again at the same rates.

Many of the plans are so badly and inaccurately drawn, that I must reject them.

Some of the contractors have failed altogether to execute the surveys for which they contracted, and hence we are unable to count on a steady progress; the county of Peebles, for example, is incomplete, for the want of the plans contracted for.

I am thus, also, unable to regulate the expenditure of the annual grants. Some of the plans contracted for are either not delivered, or are rejected; and the sums appropriated for the payment of these plans is not expended within the year, and remains in the Treasury. I therefore recommend that the system of independent contracts should be abandoned, because the best plans are not so good as those executed in the department; they will be more expensive, and will not command the same degree of confidence with the public as if executed in every detail by the department.

The plans, as now executed, command the fullest confidence with the public; and it does not appear to me to be advisable to make any alterations which may possibly shake that confidence.

At the present time there are scarcely any large surveys made but those which are under the control and executed by persons who have been employed upon the Ordnance survey. For example, the survey of London in outline was made by the Ordnance; it is filled in in detail by persons who were taught on the survey, with the sole difference that they are paid much larger salaries. In the topographical office of the War Department there are several persons taken from the Ordnance survey, draftsmen and engravers, but now paid at higher rates.

The surveys of 30 towns for the Board of Health have been made by the Ordnance, and their accuracy and perfection have never been questioned. The survey of Tasmania, Australia, the Mauritius, and Ceylon, are proceeding under officers trained upon the Ordnance survey.

The boundary between the United States and Canada was surveyed by officers and men trained on the survey.

The plans of Sebastopol are made by officers and men who were employed upon the survey.

I have just sent, by order of Lord Panmure, some men to make the survey of Erzeroum; and, without referring to any other cases, it will be obvious that if the system of independent contracts was adopted, and our establishment broken up, as it must be, the contractors would command their own prices, the work would not be so well done, and all the collateral advantages resulting from the survey as a great training department would be lost, and many years must elapse before so false a step could be recovered.

I have, &c.

(signed) *Henry James*, Lieut.-Col. R. E.

This report from Lieutenant-colonel James, as the officer in charge of the survey, is made in compliance with a Minute of the Lords of the Treasury of 14th July 1854, communicated to the Inspector-general of Fortifications, by Board's Order of 26th July 1854, T/518, and should be forwarded to the Treasury.

(signed) *H. D. H.*

5 February 1856.

Appendix, No. 2.

EXTRACTS from Communications from Contractors for the Survey of Parishes.

From Mr. *P. J. Klasen*, Contractor for the Survey of the Parishes of Cathcart, Eastwood, and Mearns, dated 17 November 1855.

"Altogether, this whole undertaking has proved the most unprofitable to me, as, up to this day, my expenditures are 418*l.*, a sum considerably larger than I shall receive."

From the same Person, dated 10 November 1855.

"The parishes of Cathcart and Eastwood are most intricate; Eastwood containing the large manufacturing town of Pollockshairs and the villages of Crosmyloop and Longside; and Cathcart, the villages of Old and New Cathcart and Busby, together with numerous manufactories and unforeseen incidents, so much so, that 3*s.* per acre would not have been remunerating, let alone 11*d.* The above two parishes alone have closely filled 22 field books."

From Messrs. *M'Cullum* and *Dundas*, Contractors for the Survey of the Parishes of Traquair and Lyne, dated 12 November 1855.

"In undertaking the contract for the surveys of Traquair and Lyne last spring, we certainly did not anticipate many of the obstacles which have since contributed to retard our progress, and which compelled us, with much reluctance, to abandon the survey of Lyne on finding the impossibility of completing it within the time specified in our contract.

"In the course of our survey we had to contend with the difficulty of obtaining and retaining the services of suitable labourers, the impossibility of procuring quarters within convenient distances of our work, in consequence of which the greater part of our time was wasted in going to and returning from the field. Several of the trigonometrical poles in the low grounds were removed by the farmers, and much time was lost before they were replaced. An error in one of the trigonometrical lines was only discovered after many chainings and much correspondence; and several minor hindrances, which we could not anticipate, all contributed to delay the completion of Traquair and the total relinquishment of Lyne. We have to express our regret that, from the causes specified, we were unable to fulfil our engagement.

"The heavy loss which we have sustained by the survey of Traquair would not have deterred us from completing Lyne, had the time permitted.

(A true copy.)

(signed) *J. Cameron*, Capt. R.E.

Appendix, No. 3.

Appendix, No. 3.

PAPERS referred to by Lieut.-Col. *James*, R. E., in his Evidence, 10 April 1856.

Westminster, 11, Great College-street,
Sir, 30 August 1855.

WITH reference to the two questions contained in your letter of the 24th instant, to which replies were requested by Lieutenant-colonel James, I have to observe,

1st. That the purpose for which the six-inch to the mile maps were obtained has been to assist me in planning a great line of canal or drain, commencing at the Humber (as a new outfall), and designed somewhere to join the old Beverley and Barmston Drain, the outfall of which is situate at Sculcoates, in the town of Hull, and discharges into the old River Hull.

The

The inefficiency of the old drain, and of its outfall, to relieve the district drained by from Beverley northward to Frodingham, renders it most important to establish a new and better outfall; and it is proposed to deliver direct into the Humber, and probably at a spot indicated by the words New Clough, East of Hessle, Sheet 240. The present scheme is to deliver at that point, within two feet of dead low-water, and at Barmston at half-tide; both, of course, through tidal gates.

In addition to the construction of this new main canal, it is proposed to convey into it, by numerous lateral cuts or open drains, the whole of the waters collected in the basin between the Humber and Beverley northward, and between the River Hull to the eastward, and a contour rising about 26 feet 6 inches above Ordnance datum westwards within these boundaries.

The whole of the country will, therefore, come to be taxed, *pro ratâ*, for advantage gained. In addition, the whole of the country lying north of Beverley, between the River Hull and the contour of 26 feet 6 inches to the west (the bulk of which is now imperfectly drained under the Beverley and Barmston Drainage Commission), together with much undrained country, will also have to be taxed to a new scale. Besides the foregoing, there lies a considerable undrained, or insufficiently drained, region between the sea, Frodingham, and Driffield, and up to Burlington, which it is desirable to bring into the same general scheme of improvement.

Previous to the publication of the Ordnance survey, there existed no maps of any portion of this extensive country which could be relied upon, or which could serve the purpose of an engineer in planning such a scheme of improvement as the one above very shortly developed. A special survey, and levels of the whole country, would have been absolutely requisite, and would have been most costly; far too costly, indeed, for the proprietors of the Beverley and Barmston Drainage to have encountered.

2dly. The maps supplied on the six-inch scale have subserved the engineering purposes in an eminently useful and economical degree.

The 25-feet contour happens to be singularly well fitted for the particular purpose above referred to; and being authoritative, its truth will not be disputed.

The very numerous bench marks are also highly valuable; I may say quite as much so as the contour; for by their means an excellent check is found for my surveyor's levellings, and is most useful to them. You will well appreciate this when I inform you that in the portion of the level south of Beverley to the Humber, there will be formed about 25 miles of lateral drains, as carriers of the water into the main canal from the lands lying on either side of it. These lateral cuts are intended to receive the water of ditches, and to be of such a depth as to receive all the waters of under-drainage which may be hereafter effected by landowners, to a depth of four to five feet. The same observations apply to the scheme north of Beverley.

You will readily also appreciate the great assistance I have derived from the correct exhibition on the maps of all drainages (so called), and of water-courses, ditches, &c.; for it is with regard to the offices of these existing drains that much respect has to be paid in planning the lateral cuts; and the lines of the most useful existing ditches have to be discovered and followed with the same view. Thus, with one of your sheets in hand, as a field map, my people have no difficulty in tracking and finding, with the aid of the level, exactly what is wanted. By the aid of these maps, indeed, a plan and near estimate of the cost of proposed works can be made at an outlay so moderate as to render it both practicable and practical enough for the purpose. The scale also exhibits every field, so that all the properties affected by the scheme in any way can be ascertained.

I may here state that my people have had frequent occasion to verify the 25-feet contour, and other levels from bench marks, and have found them most accurate.

Notwithstanding, however, all the advantages derivable by the engineer from maps on this scale, they would have been still greater, much greater to me, could I have had a survey on the "inch to the acre" ($\frac{1}{2500}$) scale, instead of that on the six inches to the mile. For, besides the exhibition of every desired topic on a working scale, the exact area of every field would have been delineated of a size which would enable value to be affixed, and taxation to be estimated, much more exactly, and (as it were) authoritatively, in regard to quantity. In this respect, the six-inch scale is especially defective.

When the scheme is more advanced, it would give me the greatest pleasure to wait upon Colonel James, should he desire it, and enter more fully into details concerning the Ordnance survey generally, and the scales which offer the greatest amount of practical utility.

I am, &c.

(signed) *Josiah Parkes.*

Captain J. Cameron, R.E.,
Ordnance Map Office, Southampton.

Appendix, No. 3.

ORDNANCE MAPS.

Preston, 18 August 1855.

Sir, (Acknowledged 8 September 1855.)

IN reply to the queries of Lieutenant-colonel James in your letter of the 14th instant, we submit the following:—

1st. "As to the immediate purposes for which the maps have been supplied which we have purchased."

We have used the six-inch scale maps for laying down proposed lines for railways, and schemes for waterworks; for extensions of waterworks and sites for reservoirs; for calculating the drainage area of districts, and estimating the value of streams of water, and for drainages (for all which purposes we have found the levels and contour lines most useful). We have also used the same scale for navigation purposes, particularly as respects the estuary of the River Ribble, and for Parliamentary purposes in various engineering works of the above description; for general references to estates, to show by colours the situations of different farms; for exchanges of land; for endorsement upon deeds of conveyance of large estates, and for purposes of evidence in references and arbitrations.

We have also used the five feet scale for sewerage and other purposes connected with town property.

2d. How far these purposes have been subserved by the maps.

We have found the maps exceedingly useful for all the purposes above enumerated, and very accurate; of course they require revising and correcting from time to time.

In many parts of this county great changes are continually going on in the state and occupation of property, and in improvements and alterations, which make such revision necessary.

We may mention, that there is a defect in the sheets of maps by the unequal contraction of the paper after printing, whereby the edges become crooked, and the sheets cannot be joined with accuracy. If this can be remedied it would be desirable.

We are, &c.

To Captain Cameron, R.E. (signed) *Park, Son & Garlick.*

Appendix, No. 4.

Appendix, No. 4.

Ordnance Map Office, Southampton,
19 April 1856.

THE Expenditure upon the Surveys of Great Britain and Ireland, up to the 31st March 1856, has been as follows; viz.

	£.
England - - - - - - - -	989,219
Scotland - - - - - - - -	283,668
Ireland - - - - - - - -	*1,077,240
£.	2,350,127

* This sum includes 136,774*l.* paid out of the Consolidated Fund for the Boundary Survey, and the sum of 84,000*l.* voted in the Irish Miscellaneous Estimates for engraving and printing the Townland Survey of Ireland.

(signed) *Henry James,*
Lieut.-Col. Royal Engineers.

Appendix, No. 5.

APPROXIMATE ESTIMATE of the COST of the SURVEYS and PLANS made for the undermentioned general purposes, to which a National Government Survey and Maps, drawn to the Scales of $\frac{1}{500}$ for Towns, and $\frac{1}{2500}$ for Rural Districts, would be applicable.

		£.
1. TITHE COMMUTATION (*England and Wales*):		
11,764 plans of parishes and tithe districts, representing, by estimation, 29,410,000 acres; and two copies of each plan, including also the cost of plans annexed to instruments of altered apportionment and glebe exchanges, and the cost of official examination - - - - - -		1,715,583
2. INCLOSURE (*England and Wales*):		
697 plans, representing 450,779 acres; and two copies of each plan, including the cost of plans annexed to deeds of exchange, and the cost of official examination - - - - - - - - - -		45,077
3. PAROCHIAL ASSESSMENT (*England and Wales*):		
512 plans of parishes, representing, by estimation, 1,280,000 acres, including the cost of official examination - - - - - - - -		64,000
Total Estimated Cost of the Surveys and Plans which have passed through the hands of the Tithe and Inclosure Commissioners - -	- - - £.	1,824,660
4. RAILWAYS (*England, Wales, and Scotland*):		
The surveys and plans made for deposit with Parliament, and those subsequently made for the purchase of lands, including also the trial levels, but not the Parliamentary sections; 12,227 miles of authorised lines, and 24,454 miles, by estimation, of projected lines, deposited but not authorised, at a moderate estimate of the prices paid during the last 30 years, exclusive of the periods of greatest excitement - - - -		1,630,250
5. HEALTH OF TOWNS (*England and Wales*):		
Survey and block plan of London, by the Ordnance Survey Department, with levels, engraved - - - - - -	£. 24,000	
Further detailed surveys, extending over 20 square miles -	20,000	
66 plans of other towns made for the General Board of Health, exclusive of Liverpool, Hull, and Edinburgh - - -	30,920	
		74,920
	£.	3,529,830

To the above might be added a considerable sum in respect of surveys for roads, canals, water supply, and the sale and transfer of property, which I have no means of estimating.

Rob. K. Dawson,
Lieut.-Colonel.

Copyhold, Inclosure, and Tithe Commission,
21 April 1856.

ANALYSIS OF INDEX.

ALPHABETICAL and CLASSIFIED LIST of the PRINCIPAL HEADINGS in the following INDEX, with the Paging at which the same will be respectively found.

PAGE

ACCURACY - - - - - 129

Aldershott Map - - - - - 129

Agricultural Purposes - - - - 129

Bench Marks - - - - - 129

CONTOURING:

1. *Generally as to the Advantages of Contouring, more especially as regards the six-inch Map* 130
2. *Adverse Opinions hereon: System recommended as more practically useful, and far cheaper* - - - - 131
3. *Conclusions of the Commission presided over by Lord Wrottesley, in* 1854 - - 131
4. *Approval by the Committee of the present System* - - 131
5. *England* - - - - 131
6. *Ireland* - - - - 131
7. *Scotland* - - - - 131

Bench Marks - - - - - 129
Fifeshire - - - - - 135
Hill Sketching - - - - 136
Lewis, Island of - - - - 140
Railways, Lines of - - - - 143

Conveyance of Property - - - - 131

COST:

1. *Twenty-five-inch Scale* - - 132
2. *Estimate for England* - - 132
3. *Estimate for Scotland* - - 132
4. *Generally as to the Cost* - 132

Skeleton Lines - - - - 144
Suspension of Orders - - - 146
Twenty-five-inch Scale - - - 149

Cultivated Districts - - - - 133
Line of Demarcation - - - 140
Uncultivated Districts - - - 150

Delay - - - - - - - 135
Northumberland - - - - 141
Suspension of Orders - - - 146

France - - - - - - - 135

Hill Sketching - - - - - 136
Contouring - - - - - 131

PAGE

Ireland - - - - - - 136
Contouring - - - - - 131

Large Scale - - - - - - 139
Skeleton Lines - - - - 144
Three-chain Scale - - - - 146
Twenty-five-inch Scale - - - 149

Line of Demarcation - - - - 140

Mines - - - - - - - - 140

One-inch Scale - - - - - 141
Delay - - - - - - 135
Geographical Purposes - - - 135
Highlands - - - - - 136
Publication - - - - - 142
Select Committee of 1851 - - - 143
Suspension of Orders - - - 146
Uncultivated Districts - - - 150

Railways, Lines of - - - - 143

Sale of Maps - - - - - 143
Six-inch Scale - - - - - 143
Contouring - - - - - 131
Cultivated Districts - - - 133
Geological Purposes - - - 135
Highland Society - - - - 135
Ireland - - - - - - 136
Lewes Estate (Ross-shire) - - 140
Line of Demarcation - - - 140
Mines - - - - - - 140
Publication - - - - - 142
Railways, Lines of - - - - 143
Tithe Commission - - - - 146
Twelve-inch Scale - - - - 149
Uncultivated Districts - - - 150
Wellington, Duke of (the late) - - 151

Skeleton Lines - - - - - 144
Suspension of Orders - - - - 146
Delay - - - - - - 135
Haddingtonshire - - - - 135

Tithe Commission - - - - - 146
Copyhold, &c. Commission - - 132
Three-chain Scale - - - - 146

Twelve-inch Scale - - - - 149
Six-inch Scale - - - - 143

	PAGE
Twenty-five inch Scale	149
Accuracy	129
Agricultural Purposes	129
Board of Health	130
Conveyance of Property	131
Copyhold Inclosure and Tithe Commission	132
Cost	132
Cultivated Districts	133
Decimal Scale	134
Drainage Operations	135
Durham (County)	135
Large Scale	139
Line of Demarcation	140
Litigation	140
Military Purposes	140
Mines	140
Railways, Lines of	143
Rating	143
Registration of Titles	143
Revision	143
Skeleton Lines	144
Tithe Commission	146
Uncultivated Districts	150
Uniform Large Scale	150
Uncultivated Districts	150
Line of Demarcation	140

I N D E X.

[*N. B.*—In this Index the *Figures* following the Names of the Witnesses refer to the Questions of the Evidence; and those following *App. p.* and *Rep. p.* to the Paging respectively of the Appendix and Report.]

A.

ACCURACY. The one-inch map does not pretend to minute accuracy; this is an advantage as compared with the proposed 25-inch map, *Brunel* 803-808——Fault of the large-scale map in affecting a detailed correctness which it does not give, and which if given, could not be relied on for any time, *ib.* 803-810. 812-818——Constant alteration in fields, houses, and the features of the country generally adverted to, as showing that the map may record facts which, after a time, cease to be such, *ib.* 803, 804. 815-818.

Means by which changes of property may be entered in the large scale map so as to continue its accuracy as to boundaries, &c., *Vignoles* 839-857—— Strong exception taken to Mr. Brunel's evidence as to the unreliable character of the 25-inch map, and as to its being sure to mislead on account of changes in the face of the country after the survey has been made, *James* 895-911. 926.——*See* also *Aldershott Map.*

Admiralty, The. See *Hydrographical Survey.*

Agricultural Purposes. Facility for obtaining accurate agricultural statistics through means of the 25-inch map, *Sir C. E. Trevelyan* 32; *James* 932——For agricultural purposes a scale of two or three chains to an inch is the one in ordinary use among surveyors, *Sopwith* 689-691. 714——Advantage of the 20-inch or 25-inch scale for general agricultural purposes, *ib.* 694. 733. 752. 761-765. 790——Agricultural statistics can never be properly obtained without the basis of a large-scale survey to go upon, *Vignoles* 837.

Aldershott Map. Proof of the accuracy of the large-scale map of Aldershott, *James* 932.

Altitudes. See *Contouring.*

Anastatic Process. The Treasury Minute of 18 May 1855, recommended that plans on the large scale should not be engraved, but that copies be made on the Anastatic process, *Sir C. E. Trevelyan* 34——Explanation of the Anastatic process; its advantages as a means of publication of the large-scale map, *James* 368-370.

Area. The acreage of England and Wales is equal to that of Ireland and Scotland put together, the two latter being each 30,000 square miles, *James* 510, 511.

Ayrshire and Dumfriesshire. Circumstances which led to the Treasury Minute of 15 July 1854, recommending the application of the 25 $\frac{1}{3}$-inch scale to Ayrshire and Dumfriesshire; this Minute read, *Sir C. E. Trevelyan* 29-32.

B.

Bavaria. With regard to foreign countries, the Bavarian map of $1\frac{5}{16}$ inch to the mile is the largest general map, *Sir R. Murchison* 599, 600——System in Bavaria by which each transfer of land is made by and is registered on the national map, *Vignoles* 839-853——Impression that the surveys in Bavaria and Baden are on a scale of 1 in 2,500, *ib.* 859.

Bench Marks. The main objection to contouring is the absence of permanent bench marks; large additional expense if these were laid down, *Dawson* 670. 674-677——Bench marks are indispensable in order to ensure accurate contours, *Vignoles* 835. 863, 864——Bench marks should be as numerous as possible, *Stephenson* 865.

Present system of contouring with bench marks on fixed objects approved of by the Committee, *Rep. p.* ix, x.

Report, 1856—*continued.*

Board of Health. Large scale of maps, both for town and country, which the General Board of Health found it necessary to adopt some five years ago, *Dawson* 183—— Expenditure of 74,920 *l.* in surveys and plans for the purposes of the Board of Health, *App. p.* 125.

Boundaries of Properties. See *Large Scale. Twenty-five-inch Scale.*

Brunel, Isambard Kingdon. (Analysis of his Evidence.)—Has frequently expressed his opinions on the present question; but like the opinions of other practical men, they have been entirely disregarded, 792, 793. 799——Concurs generally in the evidence of Mr. Sopwith, 794, 795——The map most wanted for practical public purposes is that on the one-inch scale; the want of it has been a serious inconvenience, 795. 804. 808. 810, 811——There may be, as there doubtless is, some convenience and pleasure in having a 25-inch map, but there is no utility whatever in such map as regards any purpose of civil engineering, 795-799. 802. 810. 816——A scale of 20 inches or 25 inches to the mile is a very good scale, if a large scale be adopted, 795. 801.

With respect to contouring, witness repeats the adverse opinion, before given publicly in 1851 and 1854; 799——Uselessness of contoured maps in laying down lines of railways; instance of this, 800——Very limited extent to which a 25-inch map is likely to be made use of in the transfer of property, 803——The one-inch map does not pretend to minute accuracy; this is an advantage as compared with the 25-inch map, 803-808 ——Fault of the large-scale map in affecting a detailed correctness, which it does not give, and which, if given, could not be relied on for any time, 803-810. 812-818—— Constant alteration in fields, houses, and the features of the country generally, adverted to, as showing that the map may record facts which after a time cease to be such, 803, 804. 815-818.

Brussels Conference. The 25 ⅓-inch scale was the one unanimously agreed to for property plans at the Conference at Brussels in 1853, *Dawson* 183.

Burgoyne, Sir John, General. (Analysis of his Evidence.)—Has been inspector-general of fortifications for nine years, 610, 611——Conjointly with Mr. Blamire and Mr. Rendel, decided that the weight of evidence comprised in the replies to the Treasury Minutes of 16 April 1853 and 16 January 1854 was in favour of a survey of Scotland on the 25-inch scale, 612-615.

Witness was formerly chiefly in favour of publishing on the six-inch scale, and still considers that a general survey on that scale would be very valuable, 616, 617——He has gradually become more favourable to the 25-inch scale, which he thinks would be of national importance, and extremely useful to private interests, 616. 618-621——The survey on the large scale should be plotted, and copies might readily be obtained in the event of demand for them; publishing is a different matter, 616——The extra expenditure on the large scale would not be great, and would be fully justified by the result, 618. 622-624.

C.

Colby, Colonel. Estimate by him, in 1852, of the cost of the large-scale survey, *Sir C. Trevelyan* 5. 105-110.

Completion of the Survey. With adequate annual grants the Scotch survey on the scales proposed by witness might be completed in about eight years, *James* 438-440. 464, 465. 468, 469.

Contouring:

1. *Generally as to the Advantages of Contouring, more especially as regards the Six-inch Map.*
2. *Adverse Opinions hereon; System recommended as more practically useful and far cheaper.*
3. *Conclusions of the Commission presided over by Lord Wrottesley in* 1854.
4. *Approval by the Committee of the present System.*
5. *England.*
6. *Ireland.*
7. *Scotland.*

1. *Generally as to the Advantages of Contouring, more especially as regards the Six-inch Map:*

Reasons why a large map cannot be contoured to such advantage as a small map, *James* 371, 372——Evidence as to the advantages of contouring, more especially of the modified system; examination hereon, showing how far the contour lines may be useful in laying down lines of railway, or in ascertaining the levels in drainage operations, &c., *ib.* 373-378. 425-432. 484-486. 544-568——Explanation of the process of contouring; its object, *ib.* 374-378. 429.

Expense of the modified system, as compared with the ordinary system, or with the system of levelling advocated by Colonel Dawson, *James* 425. 555. 569-582——Partial contouring

Report, 1856—*continued.*

Contouring—continued.

1. *Generally as to the Advantages of Contouring, &c.*—continued.

contouring desirable in the case of the one-inch map, *ib.* 457-459——The expense of the old system was 4 *l.* per square mile, *ib.* 569. 581, 582——£. 3 per square mile will cover the expense of the modified system, *James* 570, 571. 581, 582——Belief that the system advocated by Colonel Dawson for taking the levels will be more expensive than the modified system of contouring, *ib.* 572-575.

Advantages derivable from contouring, if it be accurately done, *Vignoles* 832-835. 862.

2. *Adverse Opinions hereon; System recommended as more practically useful and far cheaper:*

Witness is decidedly averse to contouring, and gave evidence to that effect before Lord Ellesmere's Committee in 1854, *Dawson* 200-202——Adduces arguments urged by him in opposition to it, in a printed report, dated 15 December 1853, which were laid before Lord Ellesmere's Committee, *ib.* 662. 666-670.

According to the process suggested by witness, there should be no measurement at all, but the positive altitudes should be determined and recorded on the map, *Dawson* 662-664. 671, 672——Comparative cost of contouring, and of the system recommended by witness; the latter would be about one-sixth of the former, *ib.* 662. 665. 670. 673——Practical advantage to engineers of the positive altitudes combined with the information to be obtained from the hill sketching, *ib.* 663-672——The expenditure per square mile would be about 10 *s.*, or probably not more than 6 *s.*, as against 3 *l.*, for contouring, *ib.* 673.

Witness repeats the adverse opinion, before given publicly in 1851 and 1854, *Brunel* 799.

Mode in which witness proposes to deal with the question of levels; system of contour or level points suggested, *Sopwith* 706-710.

3. *Conclusions of the Commission presided over by Lord Wrottesley in* 1854:

Recommendations by a Commission in 1854, of which Lords Ellesmere, Wrottesley, &c., were members, in favour of a partial abandonment of contouring and of the adoption of hill sketching, *Sir C. E. Trevelyan* 32-34. 138, 139——Witness had imagined that the question had already been settled by the Commission, *Dawson* 201. 662——Reference to the report of the Commission, as approving of contouring in the case of the six-inch map, but not of the 25-inch map, *James* 371. 887——The reverse of the conclusions arrived at in the report seems to have been adopted ever since, *Brunel* 799.

4. *Approval by the Committee of the present System:*

Consideration by the Committee of the several plans recommended for ascertaining and recording the levels; conclusion in favour of the system of contouring now in operation, *Rep. p.* ix, x.

5. *England:*

At present, through the suspension of orders, contouring is not being adopted in the English survey, *James* 482.

6. *Ireland:*

Contouring was adopted in the Irish survey through the recommendation of a Select Committee of the House of Commons in 1853, *Sir C. E. Trevelyan* 12-15.

7. *Scotland:*

Contouring, on the modified system, is being proceeded with in the case of the six-inch maps for Scotland, *James* 483, 484.

See also *Bench Marks. Fifeshire. Hill Sketching. Lewis, Island of. Railways, Lines of.*

Contract Work. Statement showing that contract work, by independent surveyors, cannot be relied upon as a sufficiently accurate basis for a detailed national survey, *Sir C. E. Trevelyan* 36, 37——Cost of work upon the contract system, *James* 303——Failure of the system, as regards accuracy, notwithstanding witness's precautions, *ib.* 304——Condemnation of the system, in a letter from Lieutenant-colonel James, dated 4 February 1856, *App. p.* 120, 121——Practical instances of the failure of the system, *ib.*

Conveyance of Property. Advantages to be derived from the large-scale survey, in regard to the conveyance of property, the subdivisions of land being so accurately defined that the expense and litigation consequent upon lengthy descriptions in deeds of conveyance will, for the most part, be obviated, *Sir C. E. Trevelyan* 41, 42; 71-82; 158-160; *The Lord Advocate* 625-649; *James* 932——Extracts from the report, by Lord Langdale's Commission, in 1850, showing the advantages to be derived from proper maps in regard to the investigation of title and the conveyance of property, *Dawson* 183.

Insufficiency of a 25-inch map as a means of dispensing with descriptions in deeds of conveyance in the transfer of small portions of land, *Sopwith* 791——Very limited extent

Report, 1856—*continued.*

Conveyance of Property—continued.

to which a 25-inch map is likely to be made use of in the transfer of property, *Brunel* 803.

Advantage of the large-scale map, for the purpose of transfer of property, adverted to by the Committee, *Rep. p.* vi. viii.

Copyhold, Inclosure, and Tithe Commission. Opinion expressed by the Commissioners, in answer to Treasury circular of 16 April 1853, as to the insufficiency of the six-inch scale, *Sir C. E. Trevelyan* 32——Immense amount of detail into which the operations of the Commission enter, adverted to, as illustrating the advantage of the 25-inch map, which would supply most valuable detailed information, *ib.* 32. 43, 44. 47.

Insufficiency of the second-class maps of the Tithe Commission for the purposes of the Inclosure Act, *Dawson* 174–177——Saving of expenditure by the Commission if the Tithe maps had been made on a large scale, as recommended by witness in 1837, *ib.* 177–179——Property maps on a large scale are much required in the case of altered instruments of tithe apportionment and exchanges of land under the Inclosure Act, *ib.* 185–187.

See also *Tithe Commission.*

Cost:

1. *Twenty-five-inch Scale.*
2. *Estimate for England.*
3. *Estimate for Scotland.*
4. *Generally as to the Cost.*

1. *Twenty-five-inch Scale:*

Inquiry directed by Treasury Minute of 15 July 1854, into the cost of the large scale determined on for Ayrshire and Dumfriesshire before it should be adopted generally, *Sir C. E. Trevelyan* 32——The estimated expense per acre of the large-scale survey is from 12 *d.* to 11 *d.*, and of the six-inch scale about 9 ¼ *d.*, *ib.* 36. 110——The different expense between the actual surveying for the two scales is very slight, *ib.* 39, 40.

The total expense of the large-scale survey of England was estimated by Colonel Colby, in 1852, at a million and a half, *Sir C. E. Trevelyan* 105–110——Conviction that the expenditure would be a very wise one, *ib.* 108–116——The extra expenditure on the large scale would not be great, and would be fully justified by the result, *Sir J. Burgoyne* 618. 622–624.

Statement showing that the expenditure for Scotland, since 1851, on the six-inch scale and the 25-inch scale has been 57,750 *l.* over and above the expenditure necessary for the one-inch scale, *James* 934–939.

Report by Lieutenant-Colonel James to the Inspector-General of Fortifications, dated 4 February 1856, relative to the increased cost of the plans on the 1–2500ths scale, and to the cost respectively of piece-work and independent contract work with private surveyors, *App. p.* 120, 121.

The Committee find that Colonel James's original estimates as to the cost of the large scale are borne out by the experience hitherto, *Rep. p.* vii——The expenditure will be a most judicious one *ib.* vii–x.

2. *Estimate for England:*

Estimate of 2,138,265 *l.* as the total cost of the survey (including all expenses) if conducted on the same plan as is proposed for Scotland, *James* 514–516——Items comprising this estimate, *ib.* 514.

3. *Estimate of Scotland:*

Estimate of 917,500 *l.* according to the general plan advocated by witness, as the total expense of the survey and the publication of the several maps, *James* 356–367. 371——Items comprising this estimate, *ib.* 517.

Correctness of Colonel James's estimate, *Rep. p.* vii——A sum of 284,000 *l.* having been expended, about 633,000 *l.* will be required to complete the survey on the scales, as proposed by Colonel James and as approved by the Committee, *ib.*

The Committee look upon the proposed expenditure as most judicious, *Rep. p.* vii–x——Less cost of the proposed survey of Scotland by about 300,000 *l.*, than of the Irish survey, *ib.*

4. *Generally as to the Cost:*

Reduced cost at which the survey might be conducted as compared with the cost some years ago, *Sir C. E. Trevelyan* 108. 111, 112. 117——Cost of the survey upon the systems respectively of piece-work, of daily pay, and of contract, *James* 303——All expenses whatsoever are included in witness's estimate for Scotland, as well as for England, *ib.* 454–456. 508, 509——Conviction that the estimates will, if anything, exceed the outlay, *ib.* 517.

Report, 1856—*continued.*

Cost—continued.

4. *Generally as to the Cost*—continued.

Return showing an expenditure as follows, up to 31 March 1856: viz., England 989,219 *l.*; Scotland, 283,668 *l.*; Ireland, 1,077,240 *l.*; *App. p.* 124——Items of 136,774 *l.* for the boundary survey, and of 84,000 *l.* for the townland survey, included in the expenditure for Ireland, *ib.*

See also *Skeleton Lines. Suspension of Orders. Twenty-five-Inch Scale.*

Cultivated Districts. The large scale referred to in the Treasury Minute of 15 July 1854 was ordered by another minute, dated 18 May 1855, to be confined to the cultivated districts, *James* 298-300——The 25-inch scale should only apply to the cultivated or populous districts, *ib.* 327, 328——Recommended publication of a six-inch scale, with modified contours, as regards the cultivated districts only, *Sir R. Murchison* 586-594. 607-609.——*See* also *Line of Demarcation. Uncultivated Districts.*

D.

Dawson, Lieutenant-Colonel Robert Kearsley, C.B. (Analysis of his Evidence.)—Is on the retired list of the Royal Engineers, 163——Has been an Assistant Tithe Commissioner since 1836, and has had the entire charge and conduct since that date of the mapping business of the Tithe and Inclosure Commissions, and of the Poor Law Board, 164-167——Had previously been employed for seventeen years on the Ordnance survey, &c., 166——For the last three years has acted as the professional adviser and assistant of the Treasury on the subject now before the Committee, *ib.*

Requirements of the Tithe Act in regard to parish surveys, 168——Directions given to witness, on appointment, to report to the Commission as to the purposes of general utility, besides those of the Tithe Act, to which the surveys of the Commission might be made applicable, *ib.*——Contents of witness's report adverted to; it pointed out as forcibly as possible the importance of the operation, and the opportunity which then offered for carrying out a national survey on a scale which should serve all public purposes as well as the purposes of the Tithe Act, 168——The maps on the one-inch scale were quite inapplicable for the apportionment of the tithe rentcharges, 169. 171——Inadequacy generally of a national survey on a one-inch scale, 170.

Forcible representations by the Tithe Commissioners to Government, in referring witness's report, in favour of a survey on a scale of three chains to an inch, 171——A Report by a Select Committee of the House of Commons, in May 1837, with reference to the representation of the Tithe Commissioners was unfavorable to their adoption, 171, 172——The Tithe Amendment Act followed this report, and allowed landowners to make use of any maps which they themselves approved, 172——Code of instructions subsequently drawn up by witness in 1837 for the preparation of maps which the Commissioners might certify and seal; these instructions were also adopted by the Poor Law Commissioners, 172.

The six-inch scale, as adopted in 1840 in the survey of the northern counties, having been found quite useless for the purposes of the Tithe Act, the Commissioners forcibly represented, and the Poor Law Commissioners joined in the representation, that if a map on a larger scale than the one-inch was to be made, it should be made on a scale sufficiently large for all property purposes, 172-174.

Insufficiency of the second-class maps of the Tithe Commission for the purposes of the Inclosure Act, 174-177——Satisfactory and accurate character of the first-class tithe maps, 174——Out of more than 12,000 maps in the office, there are only 2,000 first-class maps, *ib.*——Statement showing the immense public and private expenditure which might have been saved if the large-scale maps recommended in 1837 had been adopted, 177-183——The Tithe maps have cost the landowners about two millions of money, 180——The Inclosure Commissioners' maps, and the first-class Tithe maps are on a scale of 26⅔ inches to a mile, 182.

Circumstances under which witness recommended that the compilation, contemplated by the Law Amendment Society in 1847, from the Tithe maps with reference to the registration of titles, should be on a scale 13⅓ inches to a mile, 183——Remarks by Lord Langdale in 1840 as to the importance of accurate maps for the purpose of registration, *ib.*——Extracts from the Report by Lord Langdale's Commission in 1850, showing the advantages to be derived from proper maps in regard to the investigation of title and the conveyance of property, *ib.*——Large-scale maps which the Board of Health found it necessary to adopt some five or six years ago, *ib.*

With regard to the Report of the Select Committee in 1851 on the Survey of Scotland, in favour of the six-inch scale, the question of a larger scale was not investigated by the Committee, 183——Report by witness in 1853 in favour of a much larger scale for Scotland than the six-inch, *ib.*——Treasury circulars were subsequently sent to certain public departments and professional authorities throughout the country, in 1853 and 1854, the replies to which were mostly in favour of a 24-inch or 26⅔-inch scale, *ib.*

Report, 1856—*continued.*

Dawson, Lieutenant-Colonel Robert Kearsley, C.B. (Analysis of his Evidence)—*continued.*

Suggestion by witness, which led to a second circular, and to replies thereto, in favour of a 25 ⅓-inch scale or 1–2500ths of the actual measurement of the ground, 183, 184——This was the scale unanimously agreed to for property plans at the Conference at Brussels in 1853; 183——The adoption of the 25 ⅓-inch scale would be a wise and economical measure, and would give general satisfaction, 184.

[Second Examination.]—Hands in a statement of monies paid into the Tithe Office for copies and tracings of maps; and an account of fees for inspection; remarks thereon, 185——Property maps on a large scale are much required in the case of altered instruments of tithe apportionment and exchanges of land under the Inclosure Act, 185–187——With regard to the scale of 25 ⅓ inches to the mile, the Committee appointed to consider the correspondence in the Blue Book upon the subject were decidedly of opinion that the weight of evidence was in favour of such scale, 187–190——Very important character of the evidence published in the Blue Book; summary of conclusions arrived at from a careful perusal of this evidence, 190–199.

Opinion in favour of the publication of an intermediate map on a scale of 12 ⅔ inches to the mile, or one-half of the draft plan; it is far preferable to a six-inch map, 196–200. 206–223. 241–249. 260. 271——Witness is decidedly adverse to contouring, and gave evidence to that effect before Lord Ellesmere's Committee in 1854; 200–202——The scale for towns should be 126 ⅔ inches to the mile, or five times as large as that for rural districts, 203–205——Belief that the publication of a 12 ⅔-inch map would be attended with great practical convenience, and that the cost of publication would be defrayed by the sale, 207–209. 215–217. 242–245. 271.

Greater importance of publishing the 25-inch map than the 12-inch map, if one only be published, 210–214. 271——Increased convenience if both maps be published, 215–218——Disapproval of the six-inch map, as compared with a 12-inch map, 220–223. 229–232. 260——Further statement as to the advantages which might have been, or may yet be, derived from the proposed 25-inch map; it would be useful for all property purposes, whether public or private, 224–226. 233–240. 250–252. 261–270——The six-inch maps in Ireland had reference to the boundaries of townlands rather than to acreage, 229–232.

Facility for reducing the 25-inch map to any lower scale, 253–258——The use yet to be derived from such map is amply sufficient to justify the necessary expenditure for a general re-survey of the whole country on that scale, 266–270——As regards the uncultivated and mountainous districts of Scotland, the one-inch scale would be sufficient for a map, 271——The survey should however be pursued as a whole on the large scale, though it need not all be mapped on such scale, *ib.*

[Third Examination.]—With regard to the scale of 12 ⅔ inches, or half the size of the draft plans, witness further advocates a map on that scale as more useful than the six-inch map, more especially for property purposes, 650, 651. 653–657. 659——The answers to the first Treasury circular, in 1853, were conclusive in favour of the publication of the scale half the size of the draft plans; belief that the answers would have been to the same effect had it then been known that the publication of the large scale was intended, 650. 652. 660, 661——Witness does not oppose the publication of the six-inch scale, which, if demanded, and as already commenced, may be very desirable, 650, 651. 657, 658——Importance of Colonel James's suggestions for publishing the large scale, 650.

With reference to contouring, witness adduces arguments urged by him in opposition to it, in a printed report, dated 15 December 1853, which was laid before Lord Ellesmere's Committee, 662. 666–670——According to the process suggested by witness, there should be no measurement at all, but the positive altitudes should be determined and recorded on the map, 662–664. 671, 672——Comparative cost of contouring, and of the system recommended by witness; the latter would be about one-sixth of the former, 662. 665. 670. 673——Practical advantage to engineers of the positive altitudes combined with the information to be obtained from the hill sketching, 663–672——The main objection to contouring is the absence of permanent bench marks; large additional expense if these were laid down, 670. 674–677.

Dawson, Lieutenant-Colonel, C.B. Approximate estimate, by Colonel Dawson, of the cost of the surveys and plans for certain important purposes, to which a national Government survey and maps, drawn to the scale of 1–500ths for towns, and 1–2500ths for rural districts would be applicable, *App. p.* 125——The total amount is 3,529,830*l.*, *ib.*

Decimal Scale. Suggestion made by witness in favour of a decimal scale, or 1–2500ths of the actual measurement of the ground, *Dawson* 183, 184——Advantage of the scale of 1 in 2500, as being a decimal scale, *Vignoles* 838. 859.

De La Beche, Sir Henry. Opinion expressed by Sir Henry De La Beche, as to the insufficiency of the one-inch scale, *Sir C. E. Trevelyan* 2——Opinion expressed by him in favour of the six-inch scale, *James* 887.

Report, 1856—*continued.*

Delay. Great delay and expense attendant on the present system of conducting the survey, *Sopwith* 699, 700. 723. 766–772——Blame attributable to the Ordnance for delay in the production of the one-inch map, *Stephenson* 867–876——Explanation as to the delay, *James* 912——Causes and effects of the delay adverted to by the Committee, *Rep. p.* vii, viii.——*See* also *Northumberland. Suspension of Orders.*

Drainage Operations. Considerable saving, as regards both public and private drainage operations, if the large-scale map recommended by the Tithe Commissioners in 1837 had been adopted, *Dawson* 182, 183; *Rep. p.* viii.

Dumfriesshire. See *Ayrshire, &c.*

Durham County. Special circumstances and representations under which the Treasury sanctioned the adoption of the six-inch scale for the county of Durham, *Sir C. E. Trevelyan* 27–29——Nearly all Durham is surveyed on the 25-inch scale, *James* 515, 516——The uniform 25-inch scale will be useless for most practical purposes, and involve a great waste of money, *Sopwith* 699.——*See* also *Northumberland.*

E.

Elcho, Lord. See *Select Committee of* 1851.

Ellice, Edward, M. P. Report proposed by Mr. Ellice, as Member of the Committee, but not adopted, *Rep. p.* xvi–xix.

Engineering Purposes. Advantages of the proposed large scale for general engineering purposes, *Rep. p.* viii.——*See* also *One-inch Scale. Railways, Lines of. Skeleton Lines.*

Engraving. Reduced expense of late in the process of engraving as conducted in the Ordnance survey, *James* 391——Ample sum put down for the cost of engraving in the estimate for Scotland, *ib.* 454.——*See* also *Publication.*

Enlargement of Scales. See *Reduction or Enlargement of Scales.*

Expense. See *Cost.*

F.

Field Surveys. See *Ireland.*

Fifeshire. Recommendations by the Ordnance Survey Department, in June 1852, under which it was conceded that there should be a survey of Fifeshire on the six-inch scale, and upon the same principle as regards contouring, &c., as was adopted in the Ordnance survey generally, *Sir C. E. Trevelyan* 26, 27. 154, 155——Reasons of the Treasury for adopting the new system of contours in the survey of Fifeshire, though a Committee in 1854 had partly reported against the system, *ib.* 134–143.

France. Explanation of the course adopted in France in 1793, relative to the survey of that country, which was then commenced; satisfactory nature of the proceedings as compared with those in this country, *James* 277–284——Course pursued as to the publication of the maps, *ib.* 282. 445–447——The only general map published is one on the one-inch scale, *ib.* 282. 445——Sanction by the French government of an estimate of more than four millions for the national survey, *ib.* 450, 451.

G.

Geographical Purposes. As a geographical map, it is not contemplated that the 25-inch map would be useful, *Dawson* 226. 233——Great use of the one-inch for geographical purposes, *James* 473. 477; *Sopwith* 684, 685. 692. 696–698. 724. 742, 743. 788.

Geological Purposes. Importance of the six-inch map for geological purposes, *James* 355. 888. 927, 928; *Sir R. Murchison* 586——Advantage of the proposed large scale for geological surveys, *Rep. p.* viii.

H.

Haddingtonshire. Continuation of the survey on the 6-inch scale, in the case of the county of Haddington; memorial from the county on the subject, *Sir C. E. Trevelyan* 27——Considerable loss consequent on the suspense as to the scale to be adopted in the survey of this county, *James* 504–507.

Highland Society. Copy of memorial from the Highland Society to the Treasury, dated 22 March 1839, in favour of the 6-inch scale for the six northern counties of England then unsurveyed; sundry other recommendations therein as to the detailed plan of the maps, *App. p.* 116, 117; Treasury Minute on the foregoing, dated 16 April 1139, *ib.*

Report, 1856—*continued.*

Highlands. As regards 19–20ths of the Highlands, it would be a useless expenditure to publish a map on a larger scale than that of one inch to a mile, *Sir R. Murchison* 586.

See also *Uncultivated Districts.*

Hill Sketching. Inferiority of hill-sketching, or of any other system for recording the levels, to the system of contours, *James* 373, 374——Hill-sketching alone cannot be relied on for making accurate sections, *ib.* 430, 431——Suggestion that in the survey of the Highlands, the modified system of contouring be to a great extent superseded by the old system of hill-sketching and measurement of heights, *Sir R. Murchison* 586——Respect in which contouring possesses advantage over hill-sketching, *Vignoles* 835.

See also *Contouring.*

Hydrographical Survey. Concert between the Ordnance and the Admiralty departments, in regard to the survey, *Sir C. E. Trevelyan* 154, 155; *James* 528–533——Letter from the hydrographer to the Admiralty to witness, dated 5 April 1856, as to the value of the Ordnance survey, and communicating the opinions of Admiralty surveyors, &c. in favour of the six-inch map, as compared with the one-inch map, *James* 528.

I.

Inclosure Act. See *Copyhold, Inclosure, and Tithe Commission.*

Index Maps. The six-inch map would act as an index to the large-scale map, just as the one-inch map would be an index to the six-inch map, *Sir C. E. Trevelyan* 38. 90. 95.

Instructions of May 1855. With regard to the general question of the survey of Scotland, witness considers that the instructions contained in the Treasury Minute of 18 May 1855, and in Lord Panmure's letter of a subsequent date, should be carried out forthwith, *James* 583.

Intermediate Scale. The main question for the consideration of the Committee is, whether, besides drawing the survey on the large scale, and publishing on the one-inch scale, the six-inch scale, or any intermediate scale, should be engraved and published, *Sir C. E. Trevelyan* 37.——*See* also *Six-inch Scale.* *Twelve-inch Scale.*

Ireland. Adoption, in 1824, of a six-inch scale for Ireland, *Sir C. E. Trevelyan* 2——Sanction given in 1852 to the publication also of a one-inch scale, *ib.*——Commencement of the survey as a townland survey, which was subsequently extended, so as to include the subdivisions of fields and homesteads, *ib.* 2. 125, 126——The six-inch maps in Ireland had reference to the boundaries of townlands, rather than to acreage, *Dawson* 229–232.

Commencement of the Ordnance survey of Ireland in 1819, and suspension of it in 1827, *James* 284——Reference to the Report of the Select Committee in 1824 upon the Irish survey, in which a survey by townlands was recommended, in lieu of a survey by fields, *ib.*——Omission of field surveys in the original survey adverted to, to the effect that the revision consequent thereon will cost about 400,000 *l.*, *ib.* 284. 395–401——The total cost of the survey and its revision, including a six-inch map and a one-inch map, and the survey of towns on a large scale, will be about 1,288,000 *l.*, *ib.* 402–405——There were some special surveys on a larger scale than the six-inch scale, *ib.* 406——There seems to be no necessity for extending the 25-inch scale to Ireland, *ib.* 481.

See also *Contouring*, 5.

J.

James, Lieutenant-Colonel Henry, R.E. F.R.S. (Analysis of his Evidence.)—Has been superintendent of the Ordnance survey of Great Britain and Ireland since 11 August 1854; 272——Other important and scientific operations which have been under the direction of witness, 273–275——Explanation of the course adopted in France in 1793, relative to the survey of that country, which was then commenced; satisfactory nature of the proceedings, as compared with those in this country, 277–284——The first Government survey in Great Britain was undertaken in Scotland; its character; 283, 284——Very mistaken principles on which Ordnance surveys of several English counties were carried on in the earlier part of this century, 284.

Commencement of the Ordnance survey of Scotland in 1819, and suspension of it in 1827; 284——Reference to the Report of the Committee in 1824 upon the Irish survey, in which a survey by townlands was recommended in lieu of a survey by fields, 284——Inconvenience and expense consequent on the mistaken principle adopted in the earlier part of the Irish survey, of not surveying the fields; subsequent revision of this survey; 284——Economy in making the Scotch survey on a perfect principle, 284——Great mistake in adopting the six-inch scale in the survey of England and Scotland (resumed in 1840), because such scale had been found so valuable in Ireland, 284.

Counties

Report, 1856—*continued.*

James, Lieutenant-Colonel Henry, R.E., F.R.S. (Analysis of his Evidence)—*continued.*

Counties of Scotland surveyed by witness in 1851, when the six-inch scale was suspended in consequence of the Report of a Select Committee, of which Lord Elcho was chairman, 284——Probable grounds on which the Committee of 1851 recommended a one-inch scale in lieu of a six-inch scale, 284——Larger scale than the six-inch ordered by Treasury Minute of 15 July 1854 to be adopted, as regards the surveys of Ayrshire and Dumfriesshire, and of "other districts," 284–286. 295–300——Reference to the progress made in 1851, and at the present time, with the one-inch map of England, Ireland, and Scotland, 287–295.

The large scale referred to in the Treasury Minute of 15 July 1854, was ordered by another Minute, dated 18 May 1855, to be confined to the cultivated districts, 298–300——Explanation as to witness having suggested in 1855, in order to find employment for the engravers under his direction, that the county of Linlithgow should be reduced from the large scale and engraved on the six-inch scale, and again reduced to the one-inch scale; this has since been done, 300–302.

Cost of the survey upon the systems respectively of piece-work, of daily pay, and of contract, 303——Advantage of the piece-work system, 303, 304——Failure of the contract system as regards accuracy, notwithstanding witness's precautions, 304——Statement of the progress actually made with the survey of Scotland at the present time with reference both to towns and counties, and to the different scales adopted, 305–315——Great importance of a 25-inch map; testimony to its use for the registration and valuation of property, 316–326.

Argument in favour of the reduction of the 25-inch scale for the cultivated districts to the six-inch scale, 327——The 25-inch scale should only apply to the cultivated or populous districts, 327, 328——There should be a six-inch survey of the uncultivated districts, so as to ensure a uniform six-inch map, 327–329——There should also be published a general one-inch map of the whole country, 330——Obstacles to enlarging with accuracy from a six-inch scale, or from any smaller scale to a larger, though there is every facility for accurately reducing a large scale to a smaller, 327. 331–351. 381–383——Importance of the six-inch map further adverted to, 348. 352–355.

Estimate of 917,500 *l.* according to the general plan advocated by witness, as the total expense of the survey of Scotland, and the publication of the several maps, 356–367. 371——The cost of publication of the 25-inch map would be very slight, 363–366. 391——The publication may be effected either by the anastatic, the lithographic, or the zincographic process, 367——Explanation of the anastatic process; its advantages; 368–370.

Reference to the Report of Lord Ellesmere's Committee as approving of contouring in the case of the six-inch map, but not of a 25-inch map, 371——Reason why a large map cannot be contoured to such advantage as a small map, 371, 372——Argument in favour of the system of contouring, 373–378——Explanation of the process of contouring; its object, 374–378.

Successful application of the photographic process for the purpose of reducing plans from a large scale to a smaller scale, 378–381. 388–390——Anticipated successful application of photography as a means of engraving; advantages thereof, 383–387. 391——Reduced expense of late in the process of engraving, as conducted in the Ordnance survey, 391——Facility of producing copies of the large scale survey by zincography as well as lithography, 391——Grounds for the opinion that the publication of both the 25-inch and the six-inch plans would more than repay itself, 391–394.

[Second Examination.]—Further reference to the omission of field surveys in the original survey of Ireland, to the effect that the revision consequent thereon will cost about 400,000 *l.*; 395–401——The total cost of the Irish survey and its revision, including a six-inch map and a one-inch map, and the surveys of towns on a large scale, will be about 1,288,000 *l.*; 402–405——There were some special surveys on a larger scale than the six-inch scale, 406——Reason for the special survey of Phœnix Park on a large scale, in addition to the six-inch scale, 407–412. 414–416——Insufficiency of the six-inch scale for Scotland again adverted to, though useful in showing the townland boundaries in Ireland, 413.

Completion recently of the primary triangulation, which commenced in 1784, and of the primary levelling; the expense has been enormous, but the work is essential to the proposed large system of mapping, 417–421——Further evidence relative to the six-inch scale, to the effect that it having been already adopted in several counties, it is more advisable to continue it throughout (on the plan already explained), than to abandon it for the 12-inch scale, 422–424. 428.

Expense of the modified system of contouring as compared with the ordinary system, or with the system of levelling advocated by Colonel Dawson, 425. 555. 569–582——Further statement as to the advantages of contouring; examination hereon, showing how far the contour lines may be useful in laying down lines of railway, or in ascertaining the levels in drainage operations, &c., 425–432. 484–486. 544–568——Process of contouring further adverted to, 429——Hill sketching alone cannot be relied on for making accurate sections, 430, 431.

Report, 1856—*continued.*

James, Lieutenant-Colonel Henry, R.E., F.R.S. (Analysis of his Evidence)—*continued.*

Of the total estimated expense of 917,000 *l.* about 700,000 *l.* remain to be expended, of which amount it is calculated that 147,000 *l.* arising from the sale of the maps, would be returnable within a certain period, 434–436. 444——Immense saving in the construction of railways as well as in carrying out the Tithe and Inclosure Acts, if there had been a general survey on the 25-inch scale, 436. 442, 443——Strong opinion expressed by Mr. Henry Warburton, as to the importance of the large-scale map for purposes of registration, &c.; concurrence therein, 436, 437.

With adequate annual grants the Scotch survey might be completed in about eight years, 438–440. 464, 465. 468, 469——National survey being carried on in the United States; there are various scales adopted, 440. 460, 461——Extent to which there may be a saving of expenditure on future lines of railway if the large scale be adopted, 443——Further reference to the French survey; course pursued as to the publication of the maps, 445–447.

Estimate of 2,138,265 *l.* as the total cost of the survey of England (including all expenses), if conducted on the same plan as is proposed for Scotland, 448. 514–516——All expenses whatsoever are included in witness's estimates for Scotland as well as for England, 454–456. 508, 509——Up to December 1854, 336,756 *l.* had been expended on the English survey, 450——Sanction by the French Government of an estimate of more than four millions for the national survey, 450, 451——Further statement, that the engraving and publishing of the 25-inch map, as well as of the six-inch and one-inch maps, would repay the cost thereof, 452, 453. 462, 463. 474–477——Ample sum put down for the cost of engraving in the estimate for Scotland, 454.

Partial contouring desirable in the case of the one-inch map, 457–459——Return showing the net sale of the Ordnance maps during the year ending 31 March 1856; the total proceeds were 3,952 *l.* 12 *s.* 3 *d.*; 462——Loss of time and money in the Scotch survey, consequent on the suspense as to the scale to be adopted; instances of this, 465–467. 469. 504–507. 540, 541——Anticipated ready sale of the large map and the six-inch map, 470–472. 487–502——Object of the one-inch map for geographical purposes, 473–477——Object of the six-inch map for purposes of property, 473.

Inexpediency of an arbitrary boundary between the cultivated and the Highland districts, 478, 479——The plan of survey for Scotland should certainly be extended to England and Wales, 480, 481——There seems to be no necessity for extending the 25-inch scale to Ireland, 481——At present, through the suspension of orders, contouring is not being adopted in the English survey, 482——Contouring on the modified system is being proceeded with in the case of the six-inch maps for Scotland, 483, 484.

Remarks on the sale of maps in 1855–56; maps especially in demand, 487–496——The acreage of England and Wales is equal to that of Ireland and Scotland put together, 510, 511——Extent of waste land and uncultivated land in Scotland, 512, 513——Nearly all Durham is surveyed on the 25-inch scale, 515, 516——Items comprising the estimate of cost for Scotland, 517——Conviction that the estimates will, if anything, exceed the outlay, 517——Uselessness of the one-inch survey in Scotland, which was stopped in 1827, for the purposes of the six-inch survey, 518–527.

Understanding between the Ordnance office and the Admiralty relative to their respective surveys, 528–533——Letter from the hydrographer to the Admiralty to witness, dated 5 April 1856, as to the value of the Ordnance survey, and communicating the opinions of Admiralty surveyors, &c. in favour of the six-inch map as compared with the one-inch map, 528——Reference to the survey of the island of Lewis (which was not carried out under witness's superintendence) as having contained contours to a very unnecessary extent, which led to an exceptional and unjustifiable expenditure, 532–538. 576–580——Date of instructions to witness as to the scale to be adopted further adverted to, 540–543——Applicability of the proposed maps, with contour lines thereon, for railway purposes, further considered, 544–567.

With regard to the general question of the survey of Scotland, witness considers that the instructions contained in the Treasury Minute of 18 May 1855, and in Lord Panmure's letter of a subsequent date, should be carried out forthwith, 583——The survey should, in fine, be on the same principle as that adopted in the case of Linlithgowshire, 583.

[Third Examination.]—Important scientific results obtained through the completion of the primary triangulation, 887——The smaller triangulation proceeds with the detailed survey, and has been obtained so far as to admit of the completion of the survey of the south of Scotland, 887.

Further arguments in favour of a uniform six-inch map, 887——Usefulness of the six-inch map for geological purposes, 887. 927, 928——The opinions given in reply to the Treasury circulars in favour of a 12-inch scale would rather have been in favour of a six-inch scale, had it been known that copies were to be made of the 25-inch survey, 887——Approval of contours by the Commission in 1854, comprising Lords Wrottesley, Ellesmere, &c. further adverted to, 887.

Injudicious

Report, 1856—*continued.*

James, Lieutenant-Colonel Henry, R.E., F.R.S. (Analysis of his Evidence)—*continued.*

Injudicious expense involved in Mr. Sopwith's proposition for a skeleton map, in connection with the survey for a one-inch map, 887——(*Mr. Sopwith.*) Explanation that the survey for a one-inch map would be altogether independent of the plan of laying down skeleton lines or main lines of triangulation, 887–889——The skeleton lines, which should be printed, should be a mere index map, available to the general public, 888–890——(*Lieutenant-Colonel James.*) The proposal of Mr. Sopwith for a survey for the one-inch map, independently of that for the skeleton map, renders the plan peculiarly objectionable, it being not only inadequate, but exceedingly expensive, 890–894. 929–931.

Availableness of the 25-inch scale for laying down scales ten times larger, or even upon the scale of nature, if the public require such scales, 893——Strong exception taken to Mr. Brunel's evidence as to the unreliable character of the 25-inch map, and as to its being sure to mislead, on account of changes in the face of the country after the survey has been made, 895. 911–926.

Causes of delay in the publication of the one-inch map, 912——Loss in two years, since 1851, of about 25,000*l.*, through the suspension of orders as to the scales to be adopted, 912. 938–941——Rapid progress now being made with the one-inch map, 913, 914. 924, 925——Reason for not proceeding with and publishing the survey of Northumberland and Durham before that of the less important counties of Cumberland and Westmoreland, 915–923.

Great facility, through means of the 25-inch map, of dispensing with lengthy descriptions in deeds of conveyance, 932——Facility for obtaining accurate agricultural statistics through means of the map, 932——Statement showing that the expenditure since 1851 on the six-inch scale and the 25-inch scale has been 57,750*l.* over and above the expenditure necessary for the one-inch scale only, 934–939.

James, Lieutenant-Colonel. Approval by the Committee of the recommendations of Colonel James, *Rep. p.* viii–x.

L.

Lancashire. The one-inch sheets for Lancashire cannot be published without the sheets for a portion of Cumberland and Westmoreland, *James* 915, 916. 919. 923.

Landowners. Advantages to landowners, as regards transfer of property, if the large-scale map be decided on, *Sir C. E. Trevelyan* 41. 71–82. 158–160.

See also *Conveyance of Property.*

Langdale, Lord. Remarks by Lord Langdale, in 1840, as to the importance of accurate maps for purposes of registration, *Dawson* 183.

Large Scale. Reaction of public opinion in the years 1852 and 1853, and subsequently, in favour of the substitution of the large scale for the six-inch scale, *Sir C. E. Trevelyan* 18–22. 29–32. 144–147——Applications from the Ordnance Survey Department to the Treasury in 1853, for the adoption of the six-inch scale in the counties of Ayr and Dumfries; Minute of the Treasury hereon, directing the survey to be carried out on a scale sufficiently large for the six-inch, or for the still larger scale which had been advocated in 1852 and 1853, *ib.* 29–32——Reference to a Treasury circular, dated 16 April 1853, which was widely distributed for the purpose of obtaining competent opinions as to the scale most expedient to be adopted, *ib.* 31, 32——Importance of some of the answers to this circular, in favour of the large scale; the general result was that there were thirty-two opinions in favour of the six-inch scale, and ninety-two opinions in favour of larger scales, *ib.* 32.

Further circular, dated 16 January 1854, issued by the Treasury, in order to obtain data for determining what large scale should be adopted, *Sir C. E. Trevelyan* 32——Report by Sir John Burgoyne, Mr. Blamire, and Mr. Rendel, that the weight of evidence in reply to the foregoing circular was in favour of a scale according to the linear measurement of the ground to be mapped, of 1-2500ths for rural districts and 1-500ths for towns, or 25 $\frac{1}{3}$ inches to the mile for rural districts, and 126 $\frac{2}{3}$ inches to the mile for towns, *ib.*——Treasury Minute, dated 18 May 1855, showing the conclusions arrived at with reference to the system of carrying out the large scale, *ib.* 34——The Treasury never recommended that the larger plan should be limited to certain elevations or altitudes of the grounds, *ib.* 35, 36——After the survey of Scotland has been completed, the whole of England and Ireland should be surveyed on the large scale, *ib.* 103, 104.

Immense public and private expenditure which might have been saved if the larger scale maps recommended by the Tithe Commissioners in 1837 had been adopted, *Dawson* 177–183. 224–226. 233–240. 250–252——Report by witness in 1853 in favour of a much larger scale for Scotland than the six-inch, *ib.* 183——Treasury circulars were subsequently sent, in 1853, to certain public departments, and professional authorities throughout the country in 1853 and 1854, the replies to which were mostly in favour of a 24-inch or 26 $\frac{2}{3}$-inch scale, *ib.*——Suggestion by witness which led to a second circular, and to replies thereto, in favour of a 25 $\frac{1}{3}$-inch scale, or 1–2500th of the actual measurement of the ground *ib.* 183, 184.

Report, 1856—*continued.*

Large Scale—continued.

Larger scale than the six-inch ordered by the Treasury Minute of 15 July 1854 to be adopted as regards the surveys of Ayrshire and Dumfriesshire, and of "other districts," *James* 284–286. 295–300——The plan of survey for Scotland should certainly be extended to England and Wales, but not to Ireland, *ib.* 480, 481.

A scale of twenty inches or twenty-five inches to the mile is a very good scale, if any one large scale be adopted at all, *Brunel* 795. 801——A 20-inch scale is sufficient, *ib.* 801.

Sundry public and private advantages derivable from the large scale advocated by the Committee, *Rep. p.* vi, *et seq.*——The proposed expenditure on the large scale would be most judicious, *ib.* vi–x.

See also *Skeleton Lines.* *Three-chain Scale.* *Twenty-five-inch Scale.*

Law Amendment Society. Opinion expressed by the society, in answer to Treasury Circular of 16 April 1853, in favour of a scale of 13 ⅓ inches to a mile for rural districts, and eighty inches to a mile for towns, *Sir C. E. Trevelyan* 32.

Circumstances under which witness recommended that the compilation, contemplated by the Law Amendment Society in 1847 from the Tithe maps, with reference to the registration of titles, should be on a scale of 13 ⅓ inches to a mile, *Dawson* 183.

Levels. See *Contouring.*

Lewes Estate (*Ross-shire*). Inutility of the publication by Sir James Matheson of a six-inch map of the estate of the Lewes, *Sir R. Murchison* 586.

Lewis, Island of. There is a one-inch map of the island, but it is not yet fully engraved, *James* 293, 294——Reference to the survey of the island (which was not carried out under witness's superintendence), as having contained contours to a very unnecessary extent, which led to an exceptional and unjustifiable expenditure, *ib.* 532–538. 576–580.

Line of Demarcation. The extent of substitution of the six-inch scale for the large scale in Scotland must be left very much to the discretion of the superintendents, *Sir C. E. Trevelyan* 130–133——Inexpediency of an arbitrary boundary between the cultivated and the Highland districts, so as to determine positively where the 25-inch scale should cease and the six-inch scale commence, *James* 478, 479——Suggested line of demarcation between the cultivated and uncultivated districts; this may safely be left in detail to the gentleman conducting the survey, *Sir R. Murchison* 586–594. 601–603.

Linlithgowshire. Explanation as to witness having suggested in 1855, in order to find employment for the engravers under his direction, that the county of Linlithgow should be reduced from the large scale and engraved on the six-inch scale, and again reduced to the one-inch scale; this has since been done; *James* 300–302——The survey generally should be on the same principle as that adopted in the case of Linlithgowshire, *ib.* 583.

Lithography. Suggested application of lithography with a view to the publication of the large-scale map, *James* 391.

Litigation. Check to litigation (and expense) in regard to the conveyance of property, by relying for details on the contemplated 25-inch map instead of on private surveys, *Sir C. E. Trevelyan* 80–82; *The Lord Advocate* 625–649; *James* 932.

Local Contributions. The Treasury Minute of 18 May 1855 recommended that local contributions in aid of the survey should not be required, except in special cases, *Sir C. E. Trevelyan* 34.

Lord Advocate, The (*Member of the Committee*). (Analysis of his Evidence.)—Facilities to be afforded by a survey on the 25-inch scale in regard to the transfer of land; particulars hereon, showing more especially how the large map is likely to operate in saving the expense and litigation now consequent upon the descriptions in deeds of conveyance, 625–649.

M.

Military Purposes. Advantage of the proposed large scale for military purposes, *Rep. p.* viii.

Mines. Question as to the 25-inch scale being large enough for use as regards mining property, *Dawson* 237–240. 252——The underground workings of the extensive mines managed by witness are laid down on a scale of about eleven feet to a mile; necessity for so large a scale; *Sopwith* 686–688. 713——Inutility for practical mining operations of the six-inch maps with contour lines as proposed, *ib.* 701–705. 710——Greater advantage of a skeleton map to the mining interests than to the agricultural interests, *ib.* 749–752——Advantage of the proposed large scale for mineral surveys, *Rep. p.* viii.

Murchison,

Report, 1856—*continued.*

Murchison, Sir Roderick Impey. (Analysis of his Evidence.)—Director-general of the Geological Survey of the United Kingdom, 584——Gave evidence before Lord Elcho's Committee in 1851, and contended chiefly for the speedy publication of a map of Scotland on a one-inch scale, 585, 586——Bore testimony also on that occasion to the importance of a six-inch map, with contours, for geological purposes; further testimony hereon, 586——Considers, however, that the geological nature of the greater part of Scotland, the mountainous regions more especially, does not call for a six-inch map, such regions being almost entirely sterile as regards mineral wealth, 586. 593. 601, 602. 606–609.

Repetition of former opinion, in 1851, that for all purposes of a military, engineering, or geological nature, a map on a one-inch scale is fully adequate for the Highlands and Islands of Scotland, 586. 601, 602. 605–609——Approval of the publication of a six-inch scale, with modified contours, as regards the cultivated districts, 586-594. 607-609——The Highlands should be plotted on the six-inch scale, but the surveys should not be published, 586. 606. 609——Suggestion that in the survey of the Highlands the modified system of contouring be to a great extent superseded by the old system of hill-sketching and measurement of heights, 586.

Value of the plans on the 25-inch scale for property purposes, 586. 591. 604——Desirableness of extending the six-inch scale to the southern counties of Scotland, in order to facilitate the publication of the general one-inch map, 586. 607——Suggested line of demarcation between the cultivated and uncultivated districts; this may safely be left in detail to the gentleman conducting the survey, 586–594. 601–603——Propriety of publishing the 25-inch survey, if demanded by the landed proprietary, 595–598. 608——With regard to foreign countries, the Bavarian map of 1 $\frac{5}{16}$-inch to the mile is the largest published scale for a general map, 599, 600.

N.

Northumberland. Witness was recently informed that the survey of this county was deferred for three years, *Sopwith* 699, 700.

Reason for not proceeding with the survey of Northumberland and Durham before that of the less important counties of Cumberland and Westmorland, *James* 915–923.

O.

One-inch Scale. Commencement in 1784 of the survey of England on the one-inch scale; suspension of this survey, *Sir C. Trevelyan* 2——The publication of the survey of England, including the six northern counties on the one-inch scale, was conceded in consequence of public demand, *ib.*

As regards Scotland, the one-inch scale was substituted for the six-inch scale in 1851, in accordance with the report of Lord Elcho's Committee, *Sir C. Trevelyan* 2. 4–8——The Treasury Minute of 18 May 1854, recommended that the general map of Scotland on the one-inch scale should be proceeded with as quickly as possible, *ib.* 34.

Inadequacy generally of a national survey on a one-inch scale only, *Sir C. Trevelyan* 53. 90; *Dawson* 170——Progress made in 1851, and at the present time, with the one-inch map of England, Ireland, and Scotland, 287–295——There should be published a general one-inch map of the whole country, *ib.* 330——Great importance for geographical purposes of a general map on a one-inch scale, *James* 473. 477; *Sopwith* 684, 685. 692. 696–698. 724. 742, 743. 788.

Witness gave evidence before Lord Elcho's Committee in 1851, and contended chiefly for the speedy publication of a map of Scotland on a one-inch scale, *Sir R. Murchison* 585, 586——The one-inch map should be proceeded with as quickly as possible, and not delayed by the 25-inch scale, or any large-scale survey, *Sopwith* 696–699. 745–748. 763. 766. 776——In surveying for a one-inch map the plotting should be laid down on an eight-inch or ten-inch scale, *ib.* 736–741. 744.

The map much wanted for practical public purposes, is that on the one-inch scale; the want of it has been a serious inconvenience, *Brunel* 795. 804. 808. 810, 811——The one-inch map, though not so useful as a large-scale map for public purposes generally, is extremely desirable, *Vignoles* 829, 830. 838——The scale in plotting, in order to insure an accurate one-inch map, should not be much larger than the scale of the map, *Stephenson* 877, 878——Rapid progress now being made with the map, *James* 913. 924, 925.

In 1840 all England, with the exception of the six northern counties, had been published and engraved on the one-inch scale, *Rep. p.* iii——Dissatisfaction in Scotland consequent on the adoption in 1851 of the one-inch scale in lieu of a larger scale, *ib.* iv——A general map on the one-inch scale is an essential part of the plan recommended by the Committee, *ib.* ix.

See also *Delay. Geographical Purposes. Highlands. Publication. Select Committee of* 1851. *Suspension of Orders. Uncultivated Districts.*

Report, 1856—*continued.*

Original Survey. The first Government survey in Great Britain was undertaken in Scotland, *James* 283, 284——Very mistaken principles on which the Ordnance surveys of several English counties were carried on in the early part of this century, *ib.* 284——Uselessness for the purpose of the six-inch survey of the original one-inch survey in Scotland, which was stopped in 1827, *ib.* 518–527.

P,

Paisley, Sir William. The proposition of Sir William Paisley for scales of six-inch, twelve-inch, and 24-inch was soon overborne, *Sir C. E. Trevelyan* 61.

Park, Son & Garlick, Messrs. Letter from this firm, dated Preston, 18 August 1855, as to the uses derived by them from the plans on the six-inch scale and the five-feet scale, *App. p.* 124.

Parkes, Mr. Josiah. Letter from Mr. Parkes, of Great College-street, Westminster, dated 30 August 1855, as to the use of the six-inch map for purposes of drainage operations, and as to the advantages of the 1-2500 scale, *App. p.* 122, 123.

Phœnix Park, Dublin. Reason for the special survey of Phœnix Park on a large scale, in addition to the six-inch scale, *James* 407–412. 414–416.

Photography. Successful application of the photographic process for the purpose of reducing plans from a large scale to a smaller one, *James* 378–381. 388–390——Anticipated successful application of photography as a means of engraving; advantages thereof, *ib.* 383–387. 391.

Piece-work. Advantageous result of the system of piece-work, *Sir C. E. Trevelyan* 36; *James* 303, 304.

Private Surveys. Inaccuracy of the maps of the Inclosure and Tithe Department adverted to as a necessary consequence of their execution by private surveyors, *Sir C. E. Trevelyan* 45–50——Impossibility of stating the expenditure hitherto on defective surveys by public bodies and by private individuals, *ib.* 115, 116——The proposed 25-inch map would be more reliable than private maps, and would generally obviate the necessity of private surveys, *ib.* 158–162.

Proceedings of the Committee, Rep. p. xi–xix.

Progress of the Survey. The Ordnance survey is constantly in progress, and the commencement of the survey of a new county is not noted at the Treasury, *Sir C. E. Trevelyan* 152, 153——Progress actually made with the survey of Scotland at the present time, with reference both to towns and counties, and to the different scales adopted, *James* 305–315——Up to December 1854, 336,756 *l.* had been expended on the English survey, *ib.* 450——Rapid progress now being made in the one-inch map and in the survey generally, *ib.* 913; 914. 924, 925.

See also *Completion of the Survey. Delay.*

Property Purposes. See *Agricultural Purposes. Conveyance of Property. Registration of Titles. Twenty-five-inch Scale.*

Public Opinion. See *Large Scale.*

Publication. The large scale should not be engraved, but copies of it by means of the lithographic and anastatic processes should be facilitated as much as possible, *Sir E. Trevelyan* 38. 58. 92—— Particular sheets might be engraved if persons were found willing to pay for them, *ib.* 38. 58–60——The 25-inch surveys should be condensed generally into the six-inch scale, and should be engraved and published in that form, *ib.* 38. 90. 92–95——The one-inch map should be engraved and published as well as the six-inch map, *ib.* 92. 94.

Greater importance of publishing the 25-inch map than the proposed 12-inch map, if one only be published, *Dawson* 210–214. 271——Increased convenience if both maps be published, *ib.* 215–218.

The cost of publication of the 25-inch map would be very slight, *James* 363–366, 391——The publication may be effected either by the anastatic, the lithographic, or the zincographic process, *ib.* 367——The publication of both the 25-inch, the six-inch and the one-inch plans would more than repay itself; such publication is most important, *ib.* 391–394. 452, 453. 462, 463. 474. 477.

Propriety of publishing the 25-inch survey if demanded by the landed proprietary, *Sir R. Murchison* 595–598. 608——The survey on the large scale should be plotted, and copies might readily be obtained in the event of demand for them; publishing is a different matter, *Sir John Burgoyne* 616——Importance of Colonel James's suggestions, *Dawson* 650.

See also *Engraving.*

Report, 1856—*continued.*

R.

Railways, Lines of. Advantage derived from the six-inch map in laying down railway lines in Ireland, *Sir C. E. Trevelyan* 56, 57; *James* 443. 552, 553——Great saving to railway companies if the large-scale map recommended by the Tithe Commissioners in 1837 had been adopted, *Dawson* 182. 263–265; *James* 436. 442, 443; *Rep. p.* vi. viii——Extent to which there may be a saving of expenditure on future lines of railway if the large scale be adopted, *James* 443——Applicability of the proposed maps with contour lines thereon for railway purposes further considered, *ib.* 544–567.

Uselessness of contoured maps in laying down lines of railways; instance of this in Sardinia, *Brunel* 800——Considerable value of accurate contour maps for preliminary engineering purposes; instances of this in laying down lines of railway in Baden and Switzerland, *Vignoles* 832–835. 862——Witness agrees with Mr. Brunel as to the uselessness of contour maps in laying down lines of railway; practical illustration of this in Switzerland and Sardinia, *Stephenson* 865, 866.

Estimate by Colonel Dawson of an expenditure of 1,630,250*l.* for surveys and plans to which the proposed large scale would have been applicable, *App. p.* 125.

Rating. Use to be made of a 25-inch map for purposes of rating, *Dawson* 226. 261, 262. and *App. p.* 125; *Rep. p.* viii——Concurrence in opinion of the assessors of taxes in Scotland as to the importance of the 25-inch map, *James* 320–326.

Reduction or Enlargement of Scales. A large scale can always be reduced to a smaller scale, but a small scale cannot be enlarged; facility for reducing the 25-inch scale to any lower scale, *Sir C. E. Trevelyan* 39. 86; *Dawson* 253–258; *James* 327. 331–351. 381–383; *Sopwith* 717–720. 746, 747. 756–760; *Stephenson* 879–882, *Rep. p.* viii——Availableness of the 25-inch scale for laying down scales ten times larger, or even upon the scale of nature if the public require such scales, *James* 893.

Registration of Titles. Advantage of the 25-inch scale for this purpose, *Rep. p.* viii.

See also *Langdale, Lord.* *Law Amendment Society.* *Warburton, Henry.*

Revision. The authenticity of the 25-inch map in regard to boundaries and the subdivision of land would be provided for by a constant system of revision, *Sir C. E. Trevelyan* 76, 77. 118–129——There should be a revision of the survey by a competent staff from time to time, that is, from generation to generation, *ib.* 113, 114. 127. 156. 162——Nature of the staff contemplated for such revision, *ib.* 113, 114. 157. 162.

S.

Sale of Maps. There is now a clear profit of 4,000*l.* a year on the sale of the maps of the Ordnance survey generally, *James* 391——Of the total estimated expense of 917,000*l.* for Scotland, about 700,000*l.* remains to be expended, of which amount it is calculated that 147,000*l.* arising from the sale of the maps generally, would be returnable within a certain period, 434–436. 444——Return showing the net sale of the Ordnance maps during the year ending 31 March 1856; the total proceeds were 3,952*l.* 12*s.* 3*d.*, *ib.* 462——Anticipated ready sale of the large map, and the six-inch map, *ib.* 470–472. 487–502——Remarks on the sale of maps in 1855–56; maps specially in demand, *ib.* 487–496.

Sanitary Purposes. Advantage of the proposed large scale for sanitary purposes, *Rep. p.* viii.

Scales. See *Large Scale.* *One-inch Scale.* *Six-inch Scale.* *Twelve-inch Scale.* *Twenty-five Inch Scale.*

Select Committee of 1851. Explanation of the mode in which the Treasury dealt with the Report of Lord Elcho's Committee of 1851 in favour of the one-inch scale; the question of a 25-inch scale was not considered by them, *Sir C. E. Trevelyan* 8 *et seq.* 151——There was no resolution of the House in consequence of the Report of the Committee, *ib.* 10, 11——The Report of the Committee does not shake witness's opinion in favour of the six-inch scale over the one-inch scale, *ib.* 96–102.

Previously to the Treasury Circulars of 1853–54, Lord Elcho sent for witness to the Treasury, and quickly apprehended the reasons urged in favour of a larger scale than the six-inch scale, and adopted witness's views on the subject, *Dawson* 183——Probable grounds on which the Committee of 1851 recommended a one-inch scale in lieu of a six-inch scale, *James* 284.

The question before the Committee was simply the adoption of a one-inch scale or a six-inch scale, *Rep. p.* iv. vi.

Six-inch Scale. Circumstances under which it was determined by the Treasury, in 1840 and 1843, that the survey of the six northern counties of England should be on the six-inch scale, *Sir C. E. Trevelyan* 2–5——Strong opinion expressed by the Ordnance

Report, 1856—*continued.*

Six-inch Scale—continued.

Survey Department, in favour of maintaining the six-inch scale for Scotland, *Sir C. E. Trevelyan* 8. 37——Inadequacy of the six-inch map only for Scotland, though it was a great advantage to Ireland, *Sir C. E. Trevelyan* 54-57; *James* 284. 412——Limited respects in which the six-inch scale possesses advantages over the 25-inch scale; these are economy and portability, *Sir C. E. Trevelyan* 83–89.

Argument in favour of the reduction of the 25-inch scale for the cultivated districts to the six-inch scale, so as to ensure a uniform six-inch scale; advantages thereof, *James* 327. 348. 352–355. 473. 887——Further evidence relative to the six-inch scale, to the effect that, it having been already adopted in several counties, it is more advisable to continue it throughout (on the plan already explained) than to abandon it for the 12-inch scale, *ib.* 422–424. 428.

Uselessness of a six-inch scale for the mountainous districts of Scotland, *Sir R. Murchison* 586. 593. 601, 602. 606–609——Desirableness of extending the scale to the southern counties of Scotland, in order to facilitate the publication of the general one-inch map, *ib.* 586. 607——Witness was formerly chiefly in favour of publishing on the six-inch scale, and still considers that a general survey on that scale would be very valuable, *Sir J. Burgoyne* 616, 617.

Opinions of Lord Wrottesley and Sir Henry de la Beche in favour of the six-inch scale, *James* 887——Necessity of a scale proximate to the six-inch scale, in order to produce the one-inch map, *ib.* 887—— Eight counties are already engraved on that scale, *ib.*

Disapproval of the six-inch map, as compared with a 12-inch map, *Dawson* 220–223. 229–232. 260——Witness does not oppose the publication of the six-inch scale, which, if demanded, and as already commenced, may be very desirable, *ib.* 650, 651. 657, 658.

The six-inch scale is the least satisfactory of all, *Sopwith* 694, 695. 785.

Letter from Lieutenant-colonel James to the Inspector-general of Fortifications, dated 30 June 1855, recommending that the plans on the 1-2500ths scale be reduced to the six-inch, for the purpose of uniformity; also, that the boundaries of properties be shown on the Ordnance plans, *App. p.* 118, 119——Treasury Minute thereon, *ib.*——Letter from the War Department to the Treasury, expressing Lord Panmure's approval of the six-inch map, as proposed by Colonel James, *ib.* 119, 120.

Causes of the adoption of a six-inch scale for Ireland by the Select Committee of 1824, *Rep. p.* iii——Causes of the adoption at first of the six-inch scale for the six northern counties of England and the whole of Scotland, *ib.* iii, iv——Grounds on which the Committee recommend a general survey on the six-inch scale, *ib.* ix.

See also *Contouring. Cultivated Districts. Geological Purposes. Highland Society. Ireland. Lewes Estate (Ross-shire). Line of Demarcation. Mines. Publication. Railways, Lines of. Tithe Commission. Twelve-inch Scale. Uncultivated Districts. Wellington, Duke of (the late).*

Skeleton Lines. Evidence in favour of a system of skeleton lines, or lines of triangulation, to be accurately laid down by means of the Ordnance survey, *Sopwith* 696–699. 707 *et seq.* ——The skeleton lines should be laid down on a very large scale, and the details generally should be filled up by the public according as any local map was required, *ib.* 696–698 707–710. 721–728. 749–760. 782. 789——The proposed lines, laid down on some large scale, such as 80 inches to the mile, would enable Government or the public to make their plans of towns, mines, and agricultural districts on any reduced scale most convenient for local purposes, and would be preferable even without details to a uniform 25-inch mab, *ib.* 721. 732. 752–756. 763, 764. 776. 787–790.

In some instances, the detail of the skeleton map might be filled up by Government, *Sopwith* 723. 727——That part of the country commenced on the present large scale survey should be completed on such scale, *ib.* 728, 729. 733, 734. 787——The skeleton lines should at first refer to the unsurveyed districts only, but it would be advisable to extend the plan generally, *ib.* 729. 787——Saving of money and time if the skeleton lines be substituted for the 25-inch scale, *ib.* 730, 731. 766–772. 777–783. 786. 789.

Great importance of the skeleton map or system of triangulation advocated by Mr. Sopwith, *Stephenson* 867–869. 883–886——The expense of a skeleton map has not been estimated, but it would be less than that of the 25-inch map, *ib.* 868, 869. 883, 884.

Explanation that the survey for a one-inch map would be altogether independent of the plan of laying down skeleton lines on main lines of triangulation, *Sopwith* 887–889 ——The skeleton lines, which should be printed, would be a mere index map, available to the general public, *ib.* 889–890.

Injudicious expense involved in Mr. Sopwith's proposition for a skeleton map in connexion with the survey for a one-inch map, *James* 887——The proposal for the survey of the one-inch map, independently of that for the skeleton map, renders the plan peculiarly objectionable, it being not only inadequate, but exceedingly expensive, *ib.* 890–894. 929–931——The cost would probably be seven-eighths of that for a detailed and adequate survey, *ib.* 929–631.

Sopwith,

Report, 1856—*continued.*

Sopwith, Thomas. (Analysis of his Evidence.)—Mining Engineer; is also a Crown Commissioner, connected with the office of Woods and Forests, 678, 679. 711, 712——Manages the extensive lead-mines of Mr. Beaumont, in Northumberland and Durham, 680–683——Great importance for geographical purposes of a general map on a one-inch scale, 684, 685. 692. 696–698. 724. 742, 743. 788——The underground workings of the mines managed by witness are laid down on a scale of about eleven feet to a mile; necessity for so large a scale, 686–688. 713——For agricultural purposes a scale of about two or three chains to an inch is the one in ordinary use among surveyors, 689–691. 714.

Impolicy of the expenditure of publishing the survey of the kingdom on a uniform large scale, 692, 693. 699. 721. 724. 728. 788. 790——Different scales required for different purposes strongly insisted on, as showing the inexpediency of any one large scale only, 692, 693. 721. 790——Advantage of the 20-inch or 25-inch scale for general agricultural purposes, 694. 733. 752. 761–765. 790——Unsatisfactory character of the six-inch scale, 694, 695. 785.

Evidence in favour of a system of skeleton lines to be accurately laid down by means of the Ordnance survey, 696–699. 707 *et seq.*——The one-inch map should be proceeded with as quickly as possible, and not delayed by the 25-inch scale or any large-scale survey, 696–699. 745–748. 763. 766. 776——The skeleton lines, or lines of triangulation, should be laid down on a very large scale, and the details generally should be filled up by the public, according as any local map was required, 696–698. 707–710. 721–728. 749–760. 782. 789.

Great delay and expense attendant on the present system of conducting the survey, 699, 700. 723. 766–772——Inutility for practical mining operations of the six-inch maps with contour lines as proposed, 701–705. 710——Mode in which witness proposes to deal with the question of levels; system of contour or level points suggested; 706–710——Impossibility of accurately enlarging a one-inch map to a 25-inch map, or to any larger size, 717. 756–760——Facility for reducing the 25-inch scale to the one-inch, 718–720. 746, 747.

The proposed skeleton lines, laid down on some large scale, such as eighty inches to the mile, would enable Government or the public to make their plans of towns, mines, and agricultural districts on any reduced scale most convenient for local purposes, and would be preferable, even without details, to the uniform 25-inch map, 721. 732. 752–756. 763, 764. 776. 787–790——In some instances the details of the skeleton map might be filled in by Government, 723–727——That part of the country commenced on the present large-scale survey should be completed on such scale, 728, 729. 733, 734. 787——The skeleton lines should at first refer to the unsurveyed districts only, but it would be advisable to extend the plan generally, 729–787.

Saving of money and time if the skeleton lines be substituted for the 25-inch scale, 730, 731. 766–772. 777–783. 786. 789——In surveying for a one-inch map the plotting should be laid down on an eight-inch or ten-inch scale, 736–741. 744——Greater advantage of a skeleton map to the mining interests than to the agricultural interests, 749–752——Insufficiency of a 25-inch map as a means of dispensing with descriptions in deeds of conveyance in the transfer of small portions of land, 791.

Sopwith, Mr. Witness concurs in the evidence of Mr. Sopwith, *Brunel* 794, 795; *Stephenson* 865–867.

Staff. All expenses connected with the staff have, till this year, been included in the Estimates, *James* 508, 509.

Standing Orders. Advantages of the proposed large scale for Parliamentary purposes, in reference to Standing Orders, *Rep. p.* viii.

Statistics. Use of the proposed large scale for statistical purposes, *Rep. p.* viii.

Stephenson, Robert (*Member of the Committee*). (Analysis of his Evidence.)—Concurs entirely in the evidence of Mr. Sopwith, 865. 867——Agrees with Mr. Brunel as to the uselessness of contour maps in laying down lines of railway; practical illustration of this in Switzerland and Sardinia; 865, 866——The practical value of the 25-inch map is so small as to be quite incommensurate with its cost, 865——With regard to bench marks, they should be as numerous as possible, 865.

Blame attributable to the Ordnance for delay in the production of the one-inch map, 867–876——Great importance of the skeleton map or system of triangulation, advocated by Mr. Sopwith, 867–869. 883–886——The expense of a skeleton map has not been estimated, but it would be less than that of the 25-inch map, 868, 869. 883, 884——Triangulation is necessary before going on with the detailed map, 868. 883–886.

The scale in plotting, in order to ensure an accurate one-inch map, should not be much larger than the scale of the map, 877, 878——Facility for reducing a 25-inch scale to a smaller scale; the reverse does not hold good; 879–882——Many portions of the triangulation might have been accessible to the public for the last twenty years, 886.

Report, 1856—*continued.*

Superintendence. Witness has been superintendent of the Ordnance survey of Great Britain and Ireland since 11 August 1854, *James* 272——Other important and scientific operations which have been under the direction of witness, *ib.* 273-275.

Suspension of Orders. Determination by the Treasury, by Minute in December 1851, that in those counties of England and Scotland where the survey had been commenced on the six-inch scale it should be completed on that scale, but that in other counties the survey should remain in abeyance, *Sir C. E. Trevelyan*, 8, 9. 16, 17. 144——Mode in which the Ordnance Department proposed to carry into effect the Treasury Minute of December 1851; their proposition was approved by the Treasury, *ib.* 17, 18.

Counties of Scotland surveyed by 1851, when the six-inch scale was suspended in consequence of the Report of a Select Committee, of which Lord Elcho was chairman, *James* 284. 540-543——Loss of time and money in the Scotch survey consequent on the suspense as to scale to be adopted; instances of this, *ib.* 465-467. 469. 504-507. 540, 541——For fifteen, or rather sixteen months, witness was without orders, *ib.* 465-467. 540——Loss in two years, since 1851, of about 25,000 *l.*, through the suspension of orders, *ib.* 912. 938-941.

The work done on the one-inch scale previously to the suspension of the Scotch survey in 1828, was unfortunately thrown away, *Rep. p.* iii.

See also *Delay.* *Haddingtonshire.*

Switzerland. Mode in which conveyances are conducted in Switzerland, in connexion with local plans, *Vignoles* 858.

T.

Three-chain Scale. The extension of the six-inch scale to the three-chain scale recommended by the Tithe Commissioners for the six northern counties, might have been had for an additional expense of 68,500 *l.*, *Sir C. E. Trevelyan* 3, 4——Reasons which determined the Treasury not to adopt the large scale for the six northern counties, *ib.* 5.

The Inclosure Commissioners' maps and the first-class tithe maps are on a scale of 26 ⅔ inches to a mile, *Dawson* 182.

Tithe Commission. Reference to a letter from the Tithe Commissioners to the Home Office, in 1842, representing the uselessness of the six-inch scale, and recommending a larger scale, commonly termed the three-chain scale, *Sir C. Trevelyan* 3-5——The first representation in favour of the large scale was from the Tithe Commissioners and Colonel Dawson in 1837, *ib.* 5. 45. 145. 147-150——Bad policy, as now apparent, under which the representations of the Commissioners were overruled, *ib.*——Expenditure of about two millions sterling on maps for the purpose of the commutation of tithes, &c., adverted to as a great waste of public money, and as resulting mainly from the non-adoption of the large scale of survey recommended by the Commissioners, *ib.* 5. 45-50——Inaccurate and insufficient character of some of the tithe maps of the Tithe Commission, *ib.* 36, 37. 45-50.

Requirements of the Tithe Act in regard to parish surveys, *Dawson* 168——Directions given to witness, on appointment to the Tithe Commission, to report to the Commissioners as to the purposes of general utility, besides those of the Tithe Act, to which the surveys of the Commission might be made applicable, *ib.*——Contents of witness's report adverted to; it pointed out, as forcibly as possible, the importance of the operation, and the opportunity which then offered for carrying out a national survey on a scale which would serve all public purposes, as well as the purposes of the Tithe Act, *ib.*——The maps on the one-inch scale were quite inapplicable for the apportionment of the tithe rentcharges, *ib.* 169-171.

Forcible representations by the Tithe Commissioners to Government, in referring witness's report in favour of a survey on a scale of three chains to an inch, *Dawson* 171——A Report by a Select Committee of the House of Commons, in May 1837, with reference to the representations of the Tithe Commissioners, was unfavourable to their adoption, *ib.* 171, 172——The Tithe Amendment Act followed this Report, which allowed landowners to make use of any maps which they themselves approved, *ib.* 172——Code of instructions subsequently drawn up by witness, in 1837, for the preparation of maps, which the Commissioners might certify and seal; these instructions were also adopted by the Poor Law Commissioners, *ib.* 172.

The six-inch scale, as adopted in 1840, in the survey of some of the northern counties, having been found quite useless for the purposes of the Tithe Act, the Commissioners forcibly represented, and the Poor Law Commissioners joined in the representation, that if a map on a larger scale than the one-inch was to be made, it should be made on a scale sufficiently large for all property purposes, *Dawson* 172-174——Satisfactory and accurate character of the first-class tithe maps, *ib.* 174——Out of more than 12,000 maps in the Tithe Office, there are only 2,000 first-class maps, *ib.*——The maps have cost the landowners about two millions of money, *ib.* 180.

Statement

Report, 1856—*continued.*

Tithe Commission—continued.

Statement handed in of monies paid into the Tithe Office for copies and tracings of maps; and an account of fees for inspection, *Dawson* 185——Inference from the foregoing as to the value of a large-scale map, *ib.*

Estimate by Colonel Dawson of an expenditure of 1,824,660*l.* for the surveys and plans which have passed through the hands of the Tithe and Inclosure Commissioners, and to which the proposed large-scale plans would have been applicable, *App. p.* 125.

See also *Copyhold Inclosure and Tithe Commission.* *Three-chain Scale.*

Towns. Towns should be surveyed on a 10 feet scale, or 1-500th part of the actual measurement of the ground, *Sir C. E. Trevelyan* 64-68——Inadequacy of the five-feet scale, on which Edinburgh and Liverpool were first surveyed, *ib.* 64——The scale of towns should be 126⅔ inches to the mile, or five times as large as that for rural districts, *Dawson* 203-205.

Transfer of Land. See *Conveyance of Property.*

Traquair Parish. Failure of the contract system in this parish, *App. p.* 122.

Treasury Circulars. Very important character of the evidence published in the Blue Book, which arose in consequence of the Treasury Circulars in 1853 and 1854; summary of conclusions arrived at from a careful perusal of this evidence, *Dawson* 190-199——Important character of this evidence adverted to by the Committee, *Rep. p.* iii.

See also *Large Scale.*

Trevelyan, Sir Charles Edward, K. C. B. (Analysis of his Evidence.)—Has been Assistant Secretary to the Treasury since January 1840; 1——Commencement in 1784 of the survey of England on the one-inch scale; 2——Adoption in 1824 of a six-inch scale for Ireland, 2——Commencement of the Irish survey as a townland survey, which was subsequently extended so as to include the subdivisions of fields and homesteads, 2——Circumstances under which it was determined by the Treasury in 1840 and 1843, that the survey of the six northern counties of England should be on the six-inch scale instead of the one-inch scale, 2–5.

Demand subsequently, which was conceded, for the publication of the survey of England, including the six northern counties, on the one-inch scale, 2——Sanction given in 1852 to the publication of the survey of Ireland on the one-inch scale as well as the six-inch scale, 2——Substitution in 1851, as regards Scotland, of the one-inch scale for the six-inch scale, in accordance with the Report of Lord Elcho's Committee in 1851; 2. 4–8——Reference to a letter from the Tithe Commissioners to the Home Office in 1842, representing the uselessness of the six-inch scale, and recommending a larger scale, commonly termed the three-chain scale, 3–5——The extension of the six-inch scale to the three-chain scale for the six northern counties might have been had for an additional expense of 68,500*l.*; 3, 4.

The first representation in favour of the large scale was from the Tithe Commissioners, in 1837; 5——Bad policy, as now apparent, under which the representation of the Commissioners was overruled, 5—— Expenditure of about two millions sterling on maps for the purpose of the commutation of tithes, &c., adverted to as a great waste of public money, and as resulting mainly from the non-adoption of the large scale of survey recommended by the Commissioners, 5. 45–50——Reasons which determined the Treasury not to adopt the large scale for the six northern counties, 5.

Explanation of the mode in which the Treasury dealt with the Report of the Select Committee of 1851, in favour of the one-inch scale; the question of a 25-inch scale was not considered by them, 8 *et seq.* 151——Strong opinion expressed by the Ordnance Survey Department in favour of maintaining the six-inch scale, 8. 37——Determination by the Treasury, by Minute in December 1851, that in those counties of England and Scotland where the survey had been commenced on the six-inch scale, it should be completed on that scale, but that in other counties the survey should remain in abeyance, 8, 9. 16, 17. 144.

There was no resolution of The House in consequence of the Report of the Committee of 1851; 10, 11——As regards contouring, it was adopted in the Irish survey, through the recommendation of a Select Committee of The House in 1853; 12–15——Mode in which the Ordnance Department proposed to carry into effect the Treasury Minute of December 1851; their proposition was approved by the Treasury, 17, 18——Reaction of public opinion in the years 1852 and 1853, and subsequently, in favour of the substitution of the large scale for the six-inch scale, 18–22. 29–32. 144–147.

Recommendations by the Ordnance Survey Department in June 1852, under which it was conceded that there should be a survey of Fifeshire on the six-inch scale, and upon same principle as regards contouring, &c., as was adopted in the Ordnance survey generally, 26, 27. 154, 155——Continuation of the survey on the six-inch scale, in the case of the county of Haddington; memorial from the county on the subject, 27——

Report, 1856—*continued.*

Trevelyan, Sir Charles Edward, K.C.B. (Analysis of his Evidence)—*continued.*

Special circumstances and representations under which the Treasury sanctioned the adoption of the six-inch scale for the county of Durham, 27-29.

Applications from the Ordnance to the Treasury in 1853, for the adoption of a six-inch scale in the counties of Ayr and Dumfries; Minute of the Treasury hereon, directing the survey to be carried out on a scale sufficiently large for the six-inch, or for the still larger scale which had been advocated in 1852 and 1853; 29-32——Reference to a Treasury circular, dated 16 April 1853, which was widely distributed, for the purpose of obtaining competent opinions as to the scale most expedient to be adopted, 31, 32——Importance of some of the answers to this circular in favour of the large scale; the general result was that there were thirty-two opinions in favour of the six-inch scale, and ninety-two opinions in favour of larger scales, 32.

Further circular, dated 16 January 1854, issued by the Treasury, in order to obtain data for determining what large scale should be adopted, 32——Report by Sir John Burgoyne, Mr. Blamire, and Mr. Rendel, that the weight of evidence in reply to the foregoing circular, was in favour of a scale, according to the linear measurement of the ground to be mapped, of 1-2500ths for rural districts, and 1-500ths for towns; or of 25 $\frac{1}{3}$ inches to the mile for rural districts, and 126 $\frac{8}{9}$ inches to the mile for towns, 32——Treasury Minute of 15 July 1854, recommending the application of the 25 $\frac{1}{3}$-inch scale to Ayrshire and Dumfriesshire, 32——Inquiry directed by the Minute into the cost of the large scale thus determined on, before it should be adopted generally, 32——Recommendations by a Committee, of which Lord Ellesmere was chairman, in favour of a partial abandonment of contouring, and of the adoption of hill sketching, 32-34. 138, 139.

Treasury Minute, dated 18 May 1855, showing the conclusions arrived at with reference to the system of carrying out the large scale, 34——The Minute recommended the non-application of the large scale to the Highlands and uncultivated districts, for which it was suggested that the six-inch scale should suffice, 34——It recommended that plans on the large scale should not be engraved, but that copies be made on the anastatic process, 34——It also recommended that the general map of Scotland on the one-inch scale should be proceeded with as quickly as possible, 34——The Treasury never recommended that the larger plan should be limited to certain elevations or altitudes of the grounds, 35, 36.

Estimate by Colonel James, dated 4 February 1856, of the comparative expense per acre of the large scale and of the six-inch scale, 36——Statement showing that contract work by independent surveyors cannot be relied upon as a sufficiently accurate basis for a detailed national survey, 36, 37——Inaccurate and insufficient character of the maps of the Tithe Commission, 36, 37. 45-50.

The main question for the consideration of the Committee is whether, besides drawing the survey on the large scale, the six-inch scale, or any intermediate scale, should be engraved and published, as well as the one-inch scale, 37——Strong opinion in favour of a general application of the large or 25-inch scale; many and great advantages presented by it, 38-43. 71-86. 118-129. 156-162——The large scale should not be engraved, but copies of it, by means of the lithographic and anastatic processes, should be facilitated as much as possible, 38. 58. 92——Particular sheets might be engraved, if persons were found willing to pay for them, 38. 58-60.

The 25-inch survey should be condensed generally into the six-inch scale, and should be engraved and published in that form, 38. 90. 92-95——The six-inch map would act as an index to the large-scale map, just as the one-inch map would be an index to the six-inch map, 38. 90. 95——Advantages to be derived from the large-scale survey, in regard to the conveyance of property, the subdivisions of land being so accurately defined that the expense and litigation consequent upon special deeds of conveyance would be obviated, 41, 42. 71-82. 158-160.

Further reference to the Tithe Commissioners, as the parties to whom the credit belongs for having first (in 1837) advocated the large-scale survey, 45. 145. 147-150——Inaccuracy of the maps of the Inclosure and Tithe department adverted to as a necessary consequence of their execution by private surveyors, 46-50——Insufficiency of the one-inch scale for general practical purposes, 53. 90——Inadequacy of the six-inch map for Scotland, though it was a great advantage to Ireland, 54-57——Advantages derived from the six-inch map in laying down lines of railway in Ireland, 56, 57.

The proposition of Sir William Paisley, for scales of six-inch, 12-inch, and 24-inch, was soon overborne, 61——The six-inch scale is sufficiently large for the uncultivated Scottish districts, 62, 63——Towns should be surveyed on a 10-feet scale, or 1-500th part of the actual size, 64-68——Preference given to the 25-inch scale over a 24-inch scale, or any less scale, 69, 70. 161, 162——Authenticity of the 25-inch map in regard to boundaries and the subdivision of land; this would be provided for by a constant system of revision, 76, 77. 118-129.

Respects in which the six-inch scale possesses advantages over the 25-inch scale; these are economy and portability, 83-89——The one-inch map should be engraved and published,

Trevelyan, Sir Charles Edward, K.C.B. (Analysis of his Evidence)—*continued.*

published, as well as the six-inch map, 92. 94——The Report of the Select Committee of 1851 does not shake witness's opinion in favour of the six-inch scale over the one-inch scale, 96–102——After the survey of Scotland has been completed, the whole of England and Ireland should be surveyed on the large scale, 103, 104.

The total expense of the large-scale survey of England was estimated by Colonel Colby, in 1852, at a million and a half, 105–110——Conviction that the expenditure would be a very wise one, 108. 116——Reduced cost at which the survey might be conducted as compared with the cost some years ago, 108, 111, 112. 117——There should be a revision of the survey by a competent staff from time to time; that is, from generation to generation, 113, 114. 127. 156. 162——Nature of the staff contemplated for such revision, 113, 114. 157. 162.

Impossibility of stating the expenditure hitherto on defective surveys by public bodies and private individuals, 115, 116——Object of the so-called revision of the Irish survey adverted to, 125, 126——The extent of substitution of the six-inch scale for the large scale in Scotland, must be left very much to the discretion of the superintendents, 130–133——Reasons of the Treasury for adopting the then system of contours in the survey of Fifeshire, though Lord Ellesmere's Committee had partly reported against the system, 134–143.

The Ordnance survey is constantly in progress, and the commencement of the survey of a new county is not noted at the Treasury, 152, 153——Concert between the Ordnance and the Admiralty departments in regard to the survey, 154, 155——The proposed 25-inch maps would be more reliable than private maps, and would generally obviate the necessity of private surveys, 158–162.

Triangulation. Completion recently of the primary triangulation, which commenced in 1784, and of the primary levelling; the expense has been enormous, but the work is essential to the proposed large system of mapping, *James* 417–421——The triangulation of the country is indispensable, with a view to the construction of a large-scale map, as well of the proposed skeleton map, *Sopwith* 782; *Stephenson* 868. 883–886——Many portions of a triangulation might have been accessible to the public for the last twenty years, *Stephenson* 886.

The smaller triangulation proceeds with the detailed survey, and has been obtained so far as to admit of the completion of the survey of the south of Scotland, *James* 887——Important scientific results obtained through the completion of the primary triangulation, *ib.*

See also *Skeleton Lines.*

Twelve-inch Scale. Recommended publication of an intermediate map on a scale of 12⅔ inches to the mile, or one-half of the draft plan; it is far preferable to a six-inch map, *Dawson* 196–200. 206–223. 241–249. 260. 271. 650, 651. 653–657. 659——Belief that the publication of a 12⅔-inch map would be attended with great practical convenience, and that the cost of publication would be defrayed by the sale, *ib.* 207–209. 215–217. 242–245. 271——The answers to the Treasury Circular in 1853 were conclusive in favour of the publication of a scale half the size of the draft plans; belief that the answers would have been to the same effect had it then been known that the publication of the large scale was intended, *ib.* 650. 652. 660, 661.

Grounds for preferring the six-inch scale to the 12-inch scale, *James* 422–424. 428. 887——The opinions given in reply to the Treasury Circulars in favour of a 12-inch scale would rather have been in favour of a six-inch scale, had it been known that copies were to be made of the 25-inch survey, *ib.* 887.

See also *Six-inch Scale.*

Twenty-five-inch Scale. With regard to the scale of 25⅓ inches to the mile, the Committee appointed to consider the correspondence in the Blue Book upon the subject were decidedly of opinion that the weight of evidence was in favour of such scale, *Sir C. E. Trevelyan*, 32; *Dawson* 187–190; *Sir J. Burgoyne* 612–615——Strong opinion in favour of a general application of the 25-inch scale; many and great advantages presented by it, *Sir C. E. Trevelyan* 38–43. 71–86. 118–129. 156–162——Preference given to the 25-inch scale over a 24-inch scale, or any less scale, *ib.* 69, 70. 161, 162——The 25-inch scale is about an inch to an acre, *ib.* 75.

Statement of the advantages which might have been, or which may yet be, derived from the proposed 25-inch map; it would be useful for all property purposes, whether public or private, *Dawson* 177–183. 224–226. 233–240. 250–252——The adoption of the scale would be a wise and economical measure, and would give general satisfaction, *ib.* 184——The use yet to be derived from such map is amply sufficient to justify the necessary expenditure for a general re-survey of the whole country on that scale, *ib.* 266–270——The survey of Scotland should be pursued as a whole upon the large scale, though it need not all be mapped on such scale, *ib.* 271.

Twenty-five-inch Scale—continued.

Economy in making the Scotch survey on a perfect principle, *James* 284——Great importance of a 25-inch map; testimony to its use for the registration and valuation of property, *James* 316–326, and *App. p.* 119——Value of the plans on the 25-inch scale for property purposes, *Sir R. Murchison* 586. 591. 604——Witness has gradually become more favourable to the 25-inch scale, which he thinks would be of national importance, and extremely useful to private interests, *Sir J. Burgoyne* 616. 618–621——Approval of the 25-inch map, as exceedingly advantageous for several public purposes, though not for civil engineering, *Vignoles* 829, 830. 836–838. 859–861.

There may be, and there doubtless is, some convenience and pleasure in having a 25-inch map, but there is no utility whatever in such map, as regards any purposes of civil engineering, *Brunel* 795–799. 802. 810. 816——The practical value of the 25-inch map is so small as to be quite incommensurate with its cost, *Stephenson* 865.

Estimate by Colonel Dawson of an expenditure in late years of 3,529,830 *l.* for certain important purposes, to which the proposed scales of 1-500ths for towns, and 1-2500ths for rural districts would have been applicable, *App. p.* 125.

Circumstances which led to the partial adoption of the 1-2500ths scale adverted to by the Committee, *Rep. p.* v——Growing public opinion in favour of the 25-inch scale, *ib.* v, vi.

A cadastral survey of 25 inches originated with Delambre and Laplace in 1793, and was subsequently adopted under Napoleon with signal success, *Rep. p.* vi.

Resumé of the important public and private advantages which would have followed the adoption of the 25-inch scale, *Rep. p.* vi. viii——The Committee strongly recommend the adoption of the 1-2500ths scale for a cadastral survey of the country, *ib.* viii–x.

See also *Accuracy. Agricultural Purposes. Board of Health. Conveyance of Property. Copyhold Inclosure and Tithe Commission. Cost. Cultivated Districts. Decimal Scale. Drainage Operations. Durham (County). Large Scale. Line of Demarcation. Litigation. Military Purposes. Mines. Publication. Railways, Lines of. Rating. Registration of Titles. Revision of Survey. Skeleton Lines. Tithe Commission. Uncultivated Districts. Uniform Large Scale.*

U.

Uncultivated Districts. The Treasury Minute of 18 May 1855 recommended the non-application of the large scale to the Highlands and uncultivated districts, for which it was suggested that the six-inch scale would suffice, *Sir C. E. Trevelyan* 34——The six-inch scale is sufficiently large for the uncultivated Scottish districts, *ib.* 62, 63——Opinion that the one-inch scale would be sufficient for the uncultivated and mountainous districts, *Dawson* 271——There should be a six-inch survey of the uncultivated districts, so as to ensure a uniform six-inch map, *James* 327. 329. 423; *Rep. p.* ix——Witness never contemplated drawing the Highlands on the 25-inch scale, *James* 361. 423——Extent of waste land and cultivated land in Scotland, *ib.* 512, 513.

The geological nature of the greater part of Scotland, the mountainous regions especially, does not call for a six-inch map, such regions being almost entirely sterile as regards mineral wealth, *Sir R. Murchison* 586. 593. 601, 602. 606–609——Repetition of former opinion in 1851, that for all purposes of a military, engineering, or geological nature, a map on a one-inch scale is fully adequate for the Highlands and Islands of Scotland, *ib.* 586. 601, 602. 605–609——The Highlands should be plotted on the six-inch scale, but the survey should not be published, *ib.* 586. 606. 609.

See also *Line of Demarcation.*

Uniform Large Scale. Impolicy of the expenditure of publishing the survey of the kingdom on a uniform large scale, *Sopwith* 692, 693. 699. 721. 724. 728. 788. 790——Different scales required for different purposes strongly insisted on, as showing the inexpediency of any one large scale only, *ib.* 692, 693. 721. 790.

See also *Six-inch Scale. Twenty-five-inch Scale.*

United States. National survey being carried on in the United States of America; there are various scales adopted, *James* 440. 460, 461.

V.

Valuation and Assessment. Advantage of the 25-inch scale for the purposes of local valuations and assessments, *Dawson* 226. 261, 262, and *App. p.* 125; *James* 320–326; *Rep. p.* viii.——*See* also *Twenty-five-inch Scale.*

Vignoles, Charles. (Analysis of his Evidence.)—Has had considerable experience as an engineer, and is well acquainted with the principles and details of Government surveys, 819–823——

Report, 1856—*continued.*

Vignoles, Charles. (Analysis of his Evidence)—*continued.*

819–823——Was one of a commission in 1854, of which Lord Ellesmere, Lord Wrottesley, &c. were members, which drew up a report on contouring, &c. 823–827——Approves of the 25-inch map, as exceedingly advantageous for several public purposes, though not for civil engineering, 829, 830. 836–838. 859–861——The one-inch map, though not so useful as a large-scale map for public purposes generally, is extremely desirable, 829, 830. 838.

Considerable value of accurate contour maps for preliminary engineering purposes; instances of this in laying down lines of railway in Baden and Switzerland, 832–835. 862——Respect in which contouring possesses advantage over hill sketching, 835——Bench marks are indispensable, in order to ensure accurate contours, 835. 863, 864.

Means by which changes of property may be entered in the large-scale map so as to continue its accuracy as to boundaries, &c., 839–857——System in Bavaria by which each transfer of land is made by, and is registered on the national map, 839–853——Mode in which conveyances are conducted in Switzerland, 858——The surveys in Bavaria and Baden are on a scale of 1 in 2,500; 859.

W.

Walker, Mr. Reasons assigned by Mr. Walker, the civil engineer, in favour of the six-inch scale rather than of the large scale, *Sir C. E. Trevelyan* 5.

Warburton, Henry. Strong opinion expressed by Mr. Henry Warburton as to the importance of the large-scale map for purposes of registration; concurrence therein, *James* 436, 437.

Wellington, Duke of (*The late*). Opinion expressed by the late Duke of Wellington, in 1840, in favour of the six-inch scale for the six northern counties of England, then unsurveyed, *Sir C. E. Trevelyan,* 2, 3. 5.

Z.

Zincography. Facility for producing copies of the large-scale survey by zincography as well as lithography, *James* 391.

REPORT

FROM THE

SELECT COMMITTEE

ON

ORDNANCE SURVEY OF SCOTLAND

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

APPENDIX AND INDEX.

Ordered, by The House of Commons, *to be Printed,*
6 *May* 1856.

[*Price* 1*s.* 8*d.*]

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Under 24 *oz.*

REPORT

FROM THE

SELECT COMMITTEE

ON

PUBLIC OFFICES;

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

AND APPENDIX.

Ordered, by The House of Commons, *to be Printed,*
18 *July* 1856.

Lunæ, 28° *die Aprilis*, 1856.

Ordered, That a Select Committee be appointed for the purpose of considering the best means of providing Accommodation for the various Public Departments in the Neighbourhood of Downing-street, and to Report thereupon to The House.

Veneris, 23° *die Maii*, 1856.

Committee nominated, of—

Sir Benjamin Hall.	Mr. Ellice.
Lord John Manners.	Mr. Ker Seymer.
Mr. Cardwell.	Earl Grosvenor.
Mr. Disraeli.	Mr. Jackson.
Mr. Henry Baring.	Colonel Greville.
Sir Archibald Campbell.	Mr. Stirling.
Mr. Archibald Hastie.	Mr. Holford.
Lord Claud Hamilton.	

Ordered, That the Committee have power to send for Persons, Papers, and Records.

Ordered, That Five be the Quorum of the Committee.

Veneris, 30° *die Maii*, 1856.

Ordered, That Mr. Holford be discharged from further Attendance on the Committee, and that Mr. Edward Egerton be added thereto.

Veneris, 18° *die Julii*, 1856.

Ordered, That the Committee have power to Report the Minutes of Evidence taken before them to The House.

REPORT - - - - - - - - - - - - - p. iii
PROCEEDINGS OF THE COMMITTEE - - - - - - p. vi
MINUTES OF EVIDENCE - - - - - - - - - - p. 1
APPENDIX - - - - - - - - - - - - - p. 29

REPORT.

THE SELECT COMMITTEE appointed for the purpose of considering the best means of providing ACCOMMODATION for the various PUBLIC DEPARTMENTS in the Neighbourhood of Downing-street, and to Report thereupon to The House; and who were empowered to Report the MINUTES of the EVIDENCE taken before them;——HAVE considered the Matters to them referred, and have agreed to the following REPORT:—

YOUR Committee desire to call the attention of The House to the evidence which has been given in reference to the inconvenience which now results from the various public offices being located at long distances from each other; and The House will also see by a letter, dated 28th June 1856, and addressed to the Office of Works by the War Department, that exclusive of that branch of the business which is transacted at the Horse Guards, under the direction of the Commander-in-Chief, the business of the War Department is carried on at no less than 10 different places, having separate establishments of clerks and officers, amounting altogether to 498, and varying in number from two to 160 at the several establishments.

Your Committee are, therefore, of opinion that it is most desirable for the public service, both as regards economy and efficiency in the transaction of business, that there should be a concentration of the public offices, and that such concentration should be effected in the immediate vicinity of Whitehall and the Houses of Parliament.

It appears by the Evidence that the houses now occupied as offices for the public service (and which are held on lease) represent a rental of 22,000 *l.* per annum, and that the same accommodation would be afforded by public buildings three stories in height, and occupying an area of 171,638 square feet, exclusive of open spaces. But if the business of the Admiralty, now conducted at Somerset House, should be removed to Whitehall, an additional space of 42,600 square feet will be required for that purpose; and looking to the continual increase which appears to take place in the business transacted by the public offices, of which some remarkable examples may be found in the Evidence, it may be regarded as a wise economy to make some provision for additional buildings which may possibly be required within a limited time.

Your Committee have taken evidence as to the sum for which the property comprised in the area bounded by the back of Richmond-terrace, the north front of the Irish Office and Downing-street on the north; New Palace-yard and Great George-street on the south; the River Thames on the east, and St. James's-park on the west, can be obtained. That space includes, with the buildings in Downing-street, 825,275 square feet, one-half of which it is calculated must be devoted to open spaces, and the other half to new buildings. Of this area, 171,638 square feet will be required for the offices before alluded to; 42,600 square feet for the accommodation of the Admiralty business now conducted at Somerset House, and 151,535 square feet for the other offices enumerated in the schedule appended to the evidence, leaving for additional buildings likely to be required 46,864 square feet.

In this space of 825,275 square feet has been included a portion of ground, amounting to about 70,000 square feet, which it has been stated to Your Committee will probably be required for approaches to Westminster Bridge, and for

throwing open Westminster Hall to these approaches by taking down the south side of Bridge-street. For this space the sum of 250,000 *l.* has been included in the foregoing estimate. If, therefore, Parliament shall approve this appropriation of the space referred to, the sum required for the purchase of the ground for the public offices above mentioned will be reduced to 1,250,000 *l.* To this sum of 1,250,000 *l.* must be added the cost of erecting the proposed buildings, which has been stated at about 1,000,000 *l.*; on the other hand, must be deducted, of course, a capital value corresponding to the rental of the houses above referred to, viz., 22,000 *l.* a year; and it must be borne in mind, that the portion of Somerset House now occupied by the Admiralty will be set free for other purposes. An opportunity will also be afforded, without incurring any additional expense, to make a great opening from Whitehall to Westminster Abbey by erecting the new buildings on each side of such thoroughfare.

It has been shown by Your Committee, that, for reasons set forth in the Evidence, it would be an economical arrangement to acquire, at the same time, the property between the north side of Great George-street and the Broad Sanctuary, together with the west side of Princes-street.

Your Committee recommend that in case Parliament should sanction the acquisition of the properties before referred to, the design of the different public offices to be erected on the proposed site should be submitted to public competition.

18 *July* 1856.

STATEMENT, showing the Area or Superficial Content, and the Number of Stories respectively contained in the several PUBLIC BUILDINGS or DEPARTMENTS hereinafter mentioned.

	1 Story.	2 Stories.	3 Stories.	4 Stories.	5 Stories.	6 Stories.
War Departments:						
Late Ordnance Office, Pall Mall	1,511 0	—	—	—	14,635 0	—
Buckingham House, Pall Mall	3,046 0	—	—	—	5,694 0	—
No. 88, Pall Mall	352 0	—	568 0	—	1,035 0	—
No. 89, Pall Mall	633 0	—	—	—	—	1,323 0
No. 90, Pall Mall	1,968 0	—	—	—	1,488 0	—
Pembroke House, Privy Gardens	8,676 0	—	—	—	4,869 0	—
Horse Guards	3,716 0	—	8,498 0	17,402 0	3,272 0	—
Judge Advocate General's Office, No. , Great George-street	—	—	—	—	1,305 0	—
Army Medical Inspection Office, No. , De la Hay-street	—	484 0	—	—	1,515 0	—
Recruit Office, No. , Duke-street	—	—	—	—	1,181 0	—
Army Medical Board, Whitehall-yard	862 0	526 0	—	612 0	1,818 0	—
Out Pension Pay-office, Whitehall-yard	—	—	860 0	690 0	—	—
Army Works Corps, Whitehall-yard	—	1,147 0	1,360 0	—	—	—
Account Branch, Craig's-court	—	—	—	—	2,423 0	—
Commissariat Departments, Nos. 4 and 5, New-street, Spring-gardens	2,029 0	115 0	—	—	3,529 0	—
Army Clothing and Military Board, No. 13, St. James'-place	364 0	—	—	—	—	932 0
Statistical and Topographical Branch, No. 9, Adelphi-terrace	1,284 0	—	—	—	—	—
Foreign Office, Downing-street	—	726 0	—	—	11,609 0	—
Colonial Office, Downing-street	—	—	—	—	4,742 0	—
Official House of the First Lord of the Treasury, Downing-street	—	—	315 0	8,998 0	1,291 0	—
Official Residence of the Chancellor of the Exchequer, Downing-street	—	357 0	—	—	2,522 0	—
Treasury, Whitehall	—	—	—	2,520 0	10,080 0	—
Home Office, Board of Trade and Council Office, Whitehall	—	—	2,204 0	8,800 0	7,691 0	—
Statistical Branch of the Board of Trade, Nos. 1 and 2, Parliament-street	—	—	—	—	3,449 0	—
Educational Branch of the Board of Trade, No. 28, Great George-street	979 0	—	—	—	—	—

STATEMENT, showing the Area or Superficial Content, &c. of the Public Buildings or Departments hereinafter mentioned—*continued.*

	1 Story.	2 Stories.	3 Stories.	4 Stories.	5 Stories.	6 Stories.
Irish Office, No. 12, Whitehall	- -	- -	- -	- -	1,779 0	—
Office of the Director of Public Prisons, No. 45, Parliament-street	- -	- -	- -	- -	1,932 0	—
Board of Health, Richmond-terrace, Whitehall	- -	1,264 0	- -	- -	1,658 0	—
India Board, Cannon-row	- -	1,210 0	- -	8,880 0	—	—
Decimal Coinage Commission, Manchester-buildings	- -	- -	- -	- -	1,031 0	—
Poor Law Board, Whitehall	954 0	- -	768 0	3,508 0	—	—
Paymaster-general's Office, Whitehall	871 0	- -	- -	- -	7,266 0	—
Office of the Registrar of Designs, No. 1, Whitehall	- -	724 0	- -	- -	2,035 0	—
Office of Woods, Nos. 1 and 2, Whitehall-place	- -	- -	- -	- -	3,477 0	—
Late Office of the Ecclesiastical Commissioners, No. 5, Whitehall-place	- -	118 0	- -	- -	1,344 0	—
Office of the Ecclesiastical Commissioners, No. 11, Whitehall-place	1,326 0	3,003 0	- -	- -	1,519 0	—
Office of Works, Nos. 12 and 13, Whitehall-place	601 0	948 0	- -	45 0	2,820 0	—
Office of the Commissioners on Lunacy, No. 19, Whitehall-place	715 0	- -	- -	- -	- - -	1,228 0
Almonry Office, No. 1, Middle Scotland-yard	- -	- -	- -	1,098 0	—	—
Exchequer Offices, Whitehall-yard	- -	- -	- -	2,206 0	—	—
Offices of the Lord Advocate of Scotland, Lord Privy Seal and Mersey Conservancy, No. 1, New-street, Spring Gardens	619 0	171 0	- -	114 0	- - -	1,635 0
County Courts Commission, No. 2, New-street, Spring Gardens	30 0	216 0	- -	- -	1,212 0	—
Indian Law Commission, No. 19, New-street, Spring Gardens	525 0	- -	- -	- -	961 0	—
Receiver of Fines, No. 11, Spring Gardens	- -	200 0	- -	518 0	- - -	954 0
Land Revenue Enrolment Office, No. 10, Spring Gardens	606 0	- -	- -	- -	1,327 0	—
Charitable Trusts Commission, No. 1, York-street, St. James'-square	467 0	- -	1,201 0	- -	4,767 0	—
Tithe and Copyhold Commission, No. 3, St. James'-square	383 0	3,877 0	485 0	1,839 0	- - -	3,811 0
Office of the Registrar of Joint Stock Companies, Serjeants'-Inn, Fleet-street	- -	- -	- -	- -	1,675 0	—
Branch Audit Office, No. , Newcastle-street, Strand	- -	- -	- -	- -	- - -	747 0
Common Law Commission, and Office of the Registrar of Deeds by Married Women, No. 7, Lancaster-place	- -	- -	- -	- -	946 0	—
Late Office of the Registrar and Referees under the Metropolitan Buildings Act, No. , Adelphi Terrace	- -	- -	- -	- -	- - -	1,490 0
Office of the Inspectors of Anatomy, York Chambers, Buckingham-street	613 0	—	—	—	—	—
Emigration Office, No. , Park-street, Westminster	- -	- -	- -	- -	467 0	1,279 0
Office of the Home Office, Council and Oxford Commission, Nos. 17 and 18, Great Queen-street, Westminster	- -	- -	- -	- -	2,076 0	—
Civil Service Commission, Broad Sanctuary, Westminster	422 0	- -	- -	1,000 0	866 0	—
Office of the Queen's Remembrancer, No. 17, Duke-street, Westminster	- -	- -	- -	- -	1,157 0	—
State Paper Office, Duke-street, Westminster	- -	- -	- -	3,983 0	—	—
Late Office of the Divorce Commission, No. 28, Abingdon-street	- -	- -	935 0	- -	946 0	—
Law Registration Commission, No. 32, Abingdon-street	- -	- -	- -	- -	1,854 0	—
Burial's Act Office, No. 4, Old Palace-yard	910 0	—	—	—	—	—
Office of the Patriotic Fund, No. 16 A, Great George-street	- -	- -	726 0	—	—	—
Office of the Whichwood and Whittlebury Forests Commission, No. 25, Parliament-street	748 0	—	—	—	—	—
TOTAL	35,205 0	15,086 0	17,920 0	62,213 0	127,263 0	13,399 0

PROCEEDINGS OF THE COMMITTEE.

Veneris, 30° *die Maii*, 1856.

MEMBERS PRESENT:

Sir Benjamin Hall.	Mr. Stirling.
Lord Claud Hamilton.	Mr. Ker Seymer.
Mr. Jackson.	Colonel Greville.
Earl Grosvenor.	Sir Archibald Campbell.

Sir BENJAMIN HALL called to the Chair.

The Committee deliberated upon their future proceedings.

[Adjourned to Monday, 9th June, at Twelve o'clock.

Lunæ, 9° *die Junii*, 1856.

MEMBERS PRESENT:

Sir BENJAMIN HALL in the Chair.

Mr. Jackson.	Mr. Henry Baring.
Mr. E. Egerton.	Mr. Stirling.
Colonel Greville.	Mr. Cardwell.
Sir Archibald Campbell.	Mr. Disraeli.
Mr. Ker Seymer.	

Mr. *H. A. Hunt*, Surveyor of Board of Works, examined.

[Adjourned to Monday next, Twelve o'clock.

Lunæ, 16° *die Junii*, 1856.

MEMBERS PRESENT:

Sir BENJAMIN HALL in the Chair.

Lord Claud Hamilton.	Mr. E. Egerton.
Mr. Jackson.	Earl Grosvenor.
Sir Archibald Campbell.	Mr. H. Baring.
Mr. Stirling.	Mr. Cardwell.
Mr. Archibald Hastie.	Colonel Greville.

Mr. *H. A. Hunt* further examined.

Sir *Charles Trevelyan*, K. C. B., examined.

[Adjourned to Thursday next, at One o'clock.

[Postponed from Thursday to Friday, at One o'clock.

Veneris, 20° *die Junii*, 1856.

MEMBERS PRESENT:

Sir BENJAMIN HALL in the Chair.

Lord Claud Hamilton.	Earl Grosvenor.
Mr. Jackson.	Mr. H. Baring.
Mr. E. Egerton.	Mr. Ker Seymer.
Mr. Archibald Hastie.	Mr. Disraeli.
Mr. Stirling.	

Mr. *H. A. Hunt* examined.

The Committee deliberated.

[Adjourned to Tuesday, 2d July, at One o'clock, to consider Report.

Martis, 1° *die Julii*, 1856.

MEMBERS PRESENT:

Sir BENJAMIN HALL in the Chair.

Mr. Archibald Hastie.	Sir A. Campbell.
Mr. Jackson.	Mr. Cardwell.
Mr. Stirling.	Lord Claud Hamilton.
Earl Grosvenor.	Mr. Ker Seymer.
Mr. Disraeli.	Lord J. Manners.
Mr. Egerton.	

The Committee deliberated on the Report.

[Adjourned to Thursday, 10th July, at Two o'clock.

Jovis, 10° *die Julii*, 1856.

MEMBERS PRESENT:

Sir BENJAMIN HALL in the Chair.

Mr. Cardwell.	Mr. Jackson.
Colonel Greville.	Mr. H. Baring.
Sir Archibald Campbell.	Mr. Stirling.
Lord Claud Hamilton.	

The Committee further deliberated upon their Report.

[Adjourned to Wednesday next, at Three o'clock.

Veneris, 18° *die Julii*, 1856.

MEMBERS PRESENT:

Sir BENJAMIN HALL in the Chair.

Mr. Henry Baring.	Mr. Hastie.
Mr. Jackson.	Colonel Greville.
Mr. Cardwell.	Mr. Stirling.

Mr. *Hunt* further examined.

Report read 1° and 2°, and agreed to.

Ordered to Report.

LIST OF WITNESSES.

Lunæ, 9° *die Junii*, 1856.

Henry Arthur Hunt, Esq. - - - - - - - - - p. 1

Lunæ, 16° *die Junii*, 1856.

Henry Arthur Hunt, Esq. - - - - - - - - - p. 9
Sir Charles Edward Trevelyan, K.C.B. - - - - - p. 13

Veneris, 20° *die Junii*, 1856.

Henry Arthur Hunt, Esq. - - - - - - - - - p. 28

Veneris, 18° *die Julii*, 1856.

Henry Arthur Hunt, Esq. - - - - - - - - - p. 28

MINUTES OF EVIDENCE.

Lunæ, 9° *die Junii*, 1856.

MEMBERS PRESENT.

Sir Benjamin Hall.	Mr. Ker Seymer.
Mr. Edward Egerton.	Mr. Stirling.
Colonel Greville.	Mr. Henry Baring.
Mr. Jackson.	Mr. Cardwell.
Sir Archibald Campbell.	Mr. Disraeli.

THE RIGHT HON. Sir BENJAMIN HALL, BART., IN THE CHAIR.

Henry Arthur Hunt, Esq., called in; and Examined.

H. A. Hunt, Esq.

9 June 1856.

1. *Chairman.*] YOU are Surveyor to the Office of Works?—Yes.

2. Previously to your appointment to that office, I believe that you had, and that you now have, a very extensive practice as surveyor in the metropolis?—Yes.

3. Has your attention been turned towards metropolitan improvements, especially in the neighbourhood of Westminster?—Very much so.

4. Have you prepared any plan of the ground in the neighbourhood of Downing-street, setting forth that portion of the metropolis?—Yes; these plans which lie before you (*producing the same*).

5. It has been thought advisable by the present Government, and by previous Governments, that the public offices should be concentrated in the neighbourhood of Downing-street; can you make any statement as to the different sites of existing public offices in the metropolis, and the space which is occupied by those public offices?—I have had a statement drawn up, showing the superficial contents, and the number of stories in the several public buildings and departments occupied by Government under the cognizance of the Office of Works, and those buildings are scattered about in various parts of the metropolis. It is a long list, and I will hand it in.

[*The same was delivered in, and is as follows:*]

STATEMENT, showing the Area or Superficial Content, and the Number of Stories respectively contained in the several PUBLIC BUILDINGS or DEPARTMENTS hereinafter mentioned.

	1 Story.	2 Stories.	3 Stories.	4 Stories.	5 Stories.	6 Stories.
War Departments:						
Late Ordnance Office, Pall Mall	1,511 0	—	—	—	14,635 0	—
Buckingham House, Pall Mall	3,046 0	—	—	—	5,694 0	—
No. 88, Pall Mall	352 0	—	568 0	—	1,035 0	—
No. 89, Pall Mall	633 0	—	—	—	—	1,323 0
No. 90, Pall Mall	1,968 0	—	—	—	1,488 0	—
Pembroke House, Privy Gardens	8,676 0	—	—	—	4,869 0	—
Horse Guards	3,716 0	—	8,498 0	17,402 0	3,272 0	—
Judge Advocate General's Office, No. , Great George-street	—	—	—	—	1,305 0	—
Army Medical Inspection Office, No. , De la Hay-street	—	484 0	—	—	1,515 0	—
Recruit Office, No. , Duke-street	—	—	—	—	1,181 0	—
Army Medical Board, Whitehall-yard	862 0	526 0	—	612 0	1,818 0	—
Out Pension Pay-office, Whitehall-yard	—	—	860 0	690 0	—	—
Army Works Corps, Whitehall-yard	—	1,147 0	1,360 0	—	—	—
Account Branch, Craig's-court	—	—	—	—	2,423 0	—
Commissariat Departments, Nos. 4 and 5, New-street, Spring-gardens	2,029 0	115 0	—	—	3,529 0	—
Army Clothing and Military Board, No. 13, St. James's-place	364 0	—	—	—	—	932 0
Statistical and Topographical Branch, No. 9, Adelphi-terrace	1,284 0	—	—	—	—	—

(*continued*)

STATEMENT, showing the Area or Superficial Content, &c. of the Public Buildings or Departments hereinafter mentioned—*continued.*

	1 Story.	2 Stories.	3 Stories.	4 Stories.	5 Stories.	6 Stories.
Foreign Office, Downing-street	—	726 0	—	—	11,609 0	—
Colonial Office, Downing-street	—	—	—	—	4,742 0	—
Official House of the First Lord of the Treasury, Downing-street	—	—	315 0	8,998 0	1,291 0	—
Official Residence of the Chancellor of the Exchequer, Downing-street	—	357 0	—	—	2,522 0	—
Treasury, Whitehall	—	—	—	2,520 0	10,080 0	—
Home Office, Board of Trade and Council Office, Whitehall	—	—	2,204 0	8,800 0	7,691 0	—
Statistical Branch of the Board of Trade, Nos. 1 and 2, Parliament-street	—	—	—	—	3,449 0	—
Educational Branch of the Board of Trade, No. 28, Great George-street	979 0	—	—	—	—	—
Irish Office, No. 12, Whitehall	—	—	—	—	1,779 0	—
Office of the Director of Public Prisons, No. 45, Parliament-street	—	—	—	—	1,932 0	—
Board of Health, Richmond-terrace, Whitehall	—	1,264 0	—	—	1,658 0	—
India Board, Cannon-row	—	1,210 0	—	8,880 0	—	—
Decimal Coinage Commission, Manchester-buildings	—	—	—	—	1,031 0	—
Poor Law Board, Whitehall	954 0	—	768 0	3,508 0	—	—
Paymaster-general's Office, Whitehall	871 0	—	—	—	7,266 0	—
Office of the Registrar of Designs, No. 1, Whitehall	—	724 0	—	—	2,035 0	—
Office of Woods, Nos. 1 and 2, Whitehall-place	—	—	—	—	3,477 0	—
Late Office of the Ecclesiastical Commissioners, No. 5, Whitehall-place	—	118 0	—	—	1,344 0	—
Office of the Ecclesiastical Commissioners, No. 11, Whitehall-place	1,326 0	3,003 0	—	—	1,519 0	—
Office of Works, Nos. 12 and 13, Whitehall-place	601 0	948 0	—	45 0	2,820 0	—
Office of the Commissioners on Lunacy, No. 19, Whitehall-place	715 0	—	—	—	—	1,228 0
Almonry Office, No. 1, Middle Scotland-yard	—	—	—	1,098 0	—	—
Exchequer Offices, Whitehall-yard	—	—	—	2,206 0	—	—
Offices of the Lord Advocate of Scotland, Lord Privy Seal, and Mersey Conservancy, No. 1, New-street, Spring Gardens	619 0	171 0	—	114 0	—	1,635 0
County Courts Commission, No. 2, New-street, Spring Gardens	30 0	216 0	—	—	1,212 0	—
Indian Law Commission, No. 19, New-street, Spring Gardens	525 0	—	—	—	961 0	—
Receiver of Fines, No. 11, Spring Gardens	—	200 0	—	518 0	—	954 0
Land Revenue Enrolment Office, No. 10, Spring Gardens	606 0	—	—	—	1,327 0	—
Charitable Trusts Commission, No. 1, York-street, St. James's-square	467 0	—	1,201 0	—	4,767 0	—
Tithe and Copyhold Commission, No. 3, St. James's-square	383 0	3,877 0	485 0	1,839 0	—	3,811 0
Office of the Registrar of Joint Stock Companies, Serjeants'-Inn, Fleet-street	—	—	—	—	1,675 0	—
Branch Audit Office, No. Newcastle-street, Strand	—	—	—	—	—	747 0
Common Law Commission, and Office of the Registrar of Deeds by Married Women, No. 7, Lancaster-place	—	—	—	—	946 0	—
Late Office of the Registrar and Referees under the Metropolitan Buildings Act, No. Adelphi Terrace	—	—	—	—	—	1,490 0
Office of the Inspectors of Anatomy, York Chambers, Buckingham-street	613 0	—	—	—	—	—
Emigration Office, No. Park-street, Westminster	—	—	—	—	467 0	1,279 0
Office of the Home Office, Council and Oxford Commission, Nos. 17 and 18, Great Queen-street, Westminster	—	—	—	—	2,076 0	—
Civil Service Commission, Broad Sanctuary, Westminster	422 0	—	—	1,000 0	866 0	—
Office of the Queen's Remembrancer, No. 17, Duke-street, Westminster	—	—	—	—	1,157 0	—
State Paper Office, Duke-street, Westminster	—	—	—	3,983 0	—	—
Late Office of the Divorce Commission, No. 28, Abingdon-street	—	—	935 0	—	946 0	—
Law Registration Commission, No. 32, Abingdon-street	—	—	—	—	1,854 0	—
Burial's Act Office, No. 4, Old Palace-yard	910 0	—	—	—	—	—
Office of the Patriotic Fund, No. 16 A, Great George-street	—	—	726 0	—	—	—
Office of the Whichwood and Whittlebury Forests Commission, No. 25, Parliament-street	748 0	—	—	—	—	—
TOTAL	35,205 0	15,086 0	17,920 0	62,213 0	127,263 0	13,399 0

H. A. Hunt, Esq.

9 June 1856.

6. Do you wish to make any statement in explanation of that paper?—In order to arrive at the quantity of space now occupied by the several departments, I have been obliged to draw out a certain scale, such as those that occupy one story, others that occupy two stories, others that occupy three stories, and others that occupy four stories, five stories and six stories, so as to get in the aggregate the quantity of superficial feet that are occupied in one floor; so that when you have determined how many stories you would propose to have in any new buildings that may be erected, it will be easy to see what will be the total area required to give to the public offices on the concentrated site the same space that is now given to them on the distributed sites. Now I find that irrespectively of the Horse Guards, which is in my Return, but which I thought it proper to take out of this Return, because, under any circumstances, the Horse Guards, no doubt, would remain applicable to its present purpose, and therefore would not be a fair thing to add to that list; irrespectively of that I find there are 969,520 square feet superficial occupied by public offices, supposing they were all on one floor. Supposing therefore we had a new building four stories in height, the result would be you would require a superficial area on the ground-floor of the building of one-fourth of that quantity, or 242,380 feet.

7. You have alluded to the Horse Guards, which forms part of the War Department; can you tell me how many houses, or how many different places are occupied for the transaction of business in the War Department, including the Horse Guards and exclusive of the Horse Guards?—There are 17, including the Horse Guards, as described in my paper.

8. Mr.

8. Mr. *Edward Egerton.*] Can you tell us how many of those offices have been called into existence by the late war?—There are seven of those offices that have been called into requisition since the late war.

9. Will you name them?—Buckingham House and three houses adjoining; the Army Works Corps, in Whitehall-yard; the Commissariat Department, Nos. 4 and 5, New-street, Spring Gardens, and the Statistical and Topographical Department in Adelphi-terrace, which is a very small affair—only one story; 1,284 feet.

10. Mr. *Jackson.*] Does the 969,000 superficial feet include the Admiralty?—No.

11. Sir *Archibald Campbell.*] Does it include Somerset House?—No.

12. *Chairman.*] For most of those offices, the titles of which are given in your statement, do the Government pay rent?—I understand that the Government pay rent for a great number of them. I know that of my own knowledge. I do not know the full extent of it, but I believe it to be about 30,000 *l.* a year.

13. Mr. *Jackson.*] Have you measured the superficial area upon which the Admiralty stands, and the Inland Revenue, Somerset House?—I have not.

14. Should you be enabled to do so before we meet again?—Certainly, if the Committee direct it.

15. *Chairman.*] Exclusive of the offices enumerated in your list, there are the offices at Somerset House?—Yes; a great number of other offices which I have not enumerated are at Somerset House and the Mint.

16. Somerset House is not taken into account in your statement?—Not at all.

17. But at Somerset House a great portion of the Admiralty business, and the Inland Revenue and Taxes, is carried on?—Yes.

18. Looking at the map which you have laid before the Committee, what space of ground do you think would be required for the establishment of the public offices in the neighbourhood of Downing-street, and where would you propose to put them?—I can give you the exact area of ground applicable for the proposed buildings, and I can give you the space which is now occupied by the buildings which I have enumerated. Of course, to say how much space the new buildings will require, and how much will be devoted to open spaces and streets, will depend very much upon the design which may be prepared for that purpose. It is difficult to say what that would be. But, supposing you were to take the whole of the property upon this Plan, except Richmond-terrace and the Duke of Buccleuch's House, beginning with the Treasury buildings and the Board of Trade, and thence to the Foreign Office, taking that block and the other block tinted blue, and taking the whole of the property right up to the Park on the one side and to the Thames on the other, and to Great George-street on the south, the whole of that would be an available space to build on of about 825,000 feet. Supposing the whole of that space to be at the disposal of the architect who made the design for concentrating the public buildings upon that site, he would have for buildings, and for his architectural effects and open spaces and thoroughfares, 825,000 feet. Then supposing buildings to be four stories high, you only want one-fourth of that area; that would be 206,250 feet out of 825,000. But, in the first place, out of that you would want at the very least one-half for open spaces. Under ordinary circumstances, in laying out an ordinary estate, you would require that one-third of the space, at least, should be devoted to roads, and so on; but in this, which is to be a great architectural affair, you would want at least one-half; so that that would be 412,500 off the 825,000: that would leave 412,500 for buildings. Now you require, in point of fact, according to this statement, 242,380, that is, supposing you do not want to increase the accommodation. But it is perfectly well known to the right honourable gentleman in the Chair, from the Returns which he has called for in his department, of the quantity of space required for those offices from which we have been able to get returns, that they ask for about three times as much as they have at present; some of them double, some of them three times. I know from my intercourse with some of the members of the Board of Trade, that the accommodation at present is wholly insufficient. So that in any calculation which you make, you must calculate for an increased amount of accommodation.

19. Mr. *Edward Egerton.*] You make this calculation upon the existing space of those offices?—Yes; supposing them not to require any additional accommodation, and supposing they put up a building four stories high, which,

H. A. Hunt, Esq.

9 June 1856.

in an architectural point of view is perhaps hardly desirable, then we should have to spare out of the quantity that we have (supposing we give half for roads, and so on), 170,120 feet for other buildings, or for an enlargement of the present accommodation. I think you would find, judging from the statements of official men, as to the increasing business of the country in various departments, that that extra space would very soon be required by those various departments. Take, for example, the department of the Board of Works, as much room again is wanted in that department.

20. You are aware that, from the Board of Trade, we have a return which sets forth that they require considerably more accommodation than they have at present; now supposing you add to the whole quantity one-third for the extra accommodation required, what space would be left after making that addition?—There would be about 90,000 feet left.

21. Mr. *Jackson.*] Take the new buildings at three stories instead of four, and what will that give?—That would give 323,173 feet to deal with. Taking 323,173 from 412,500, it leaves 89,327 feet instead of 170,120 feet.

22. What additional property is there contiguous to that which you have named, which might be brought in in order to provide for the Admiralty and the Inland Revenue, and to give you an increased quantity of extra space?—There is no property immediately contiguous to this, except the south side of Great George-street, taking down the Westminster Hospital, and the Sessions House. On that side you might have an extension.

23. Supposing you took down Richmond-terrace and Montague House, and the whole of the property behind Whitehall-place to the river's edge, would that give you sufficient space?—It would be a very great thing, and would of course afford very large accommodation, and it would have a very fine architectural effect, but it would cost a large sum of money. Richmond-terrace, for instance.

24. Leaving the question of cost for after consideration, would that give you sufficient space to carry out the object of consolidating all the various Government departments on a spot contiguous to the Houses of Parliament?—It would afford a very much larger space than is now proposed by this plan. I cannot tell, as I stated before, how much accommodation we shall require in the public offices, because that is not ascertained yet. Of course, if you provide for the Admiralty here, or if you remove any other public offices which I have not enumerated, to this site, we shall want more ground.

25. Is there any other spot which you would prefer to that which you have named for the site of other Government offices, supposing more space was required?—Speaking architecturally, and for public purposes, I should think it better than any other that I know.

26. Sir *Archibald Campbell.*] Have you made any calculation as to the extent of these additional areas?—No, I have not.

27. *Chairman.*] Supposing it should be deemed advisable to purchase all the property from Downing-street on the north to Great George-street on the south, and from the Thames on the east to St. James's Park on the west, for the purpose of new Government offices, would not there be some adjacent property which would be so materially increased in value that it would be desirable for the Government to purchase also that property in the first instance to provide for the case of any further extension being deemed desirable on the south side of Great George-street?—No doubt it would be desirable to have the power of taking all the property within the immediate vicinity, including Princes-street and the corner of Victoria-street and Queen-street, and the terrace which looks on to the Birdcage-walk, Princes-court it is called; but that depends entirely upon the quantity that you are likely to appropriate hereafter for public purposes. It would not be desirable to schedule the whole neighbourhood unless you have some probable intention of using it for public purposes.

28. Mr. *Jackson.*] According to your statement, and taking only the area which you have proposed, if the new buildings are to be erected three stories high you will only have an increase of 89,327 feet over the present accommodation for the public offices you have enumerated, leaving out altogether the Inland Revenue and the Admiralty?—Certainly.

29. *Chairman.*] Supposing all those offices are to be concentrated in the space you have delineated, would it, in your opinion, be advisable for the Government to acquire also the block of buildings which lies between Great George-street and Westminster Abbey?—I think it would; and not only that, but

but you will recollect that there is the Stationery Office, that was the Mews; you would hardly be able to interfere with that, a large sum of money having just been laid out upon it; but you might include all the property between Great George-street and the Broad Sanctuary, leaving out of course the Westminster Hospital, the Stationery Office, and the Sessions House.

30. Supposing the great improvement which is contemplated by the appointment of this Committee was made in Downing-street, would not the value of the property on the south side of Great George-street be immensely increased?—No doubt.

31. Therefore if the acquisition of that property for public offices is contemplated provision ought to be made for it in the Bill for the purpose of acquiring it at once?—No doubt for the public interest that should be done.

32. Mr. *Jackson.*] Is not it equally desirable that the property to the south of Westminster Abbey which lies parallel to the New Houses of Parliament should be purchased also?—These proposed improvements, even supposing them to be confined to the purpose shown upon the plan, will have the effect no doubt of improving the whole neighbourhood; Abingdon-street, Millbank-street, and all that district, must necessarily feel the effect of it, because there are a vast number of most respectable and important professional men and others located in Great George-street and Parliament-street, and all that vicinity, whom you would remove. I should think there is no doubt that Abingdon-street must some day or other come down, if it is only to make a better access to the Houses of Parliament; and there is the Westminster School and the Abbey, and other parts of the neighbourhood, which might be thrown open with great effect and great advantage to the public, and the whole of Millbank-street; in fact, you could get a continuous thoroughfare by the fine embankment which has been formed from the new bridge at Chelsea right away to the Houses of Parliament.

33. Would not the effect of the removal of all the property shown in your plan be to drive all the Parliamentary agents and other parties who have business connexions with Parliament to the south side of the Abbey?—No doubt, or to Victoria-street, which is in the immediate vicinity. One good effect which these improvements would have, in my opinion, would be the resuscitation of Victoria-street, and the removal of all the wretched miserable property which adjoins it on both sides.

34. You would think it a prudent step on behalf of the Government to take hold at once of a sufficient amount of property to enable them, without entailing additional expense hereafter upon the country, to carry out all those improvements which are likely to be required in order to afford complete accommodation for the Government Departments in the vicinity of the Houses of Parliament?—I think most desirable.

35. You think it would be a saving to the country hereafter if that were done now?—Undoubtedly.

36. *Chairman.*] Supposing the public offices were concentrated on the site set forth in your plan, what property do you think it would be desirable for the Government to take power to purchase in that immediate neighbourhood at once?—This is the block delineated on the plan, bounded on the north by Dover House and the back of Richmond-terrace, on the west by St. James's Park, on the south by Great George-street and New Palace-yard, and on the east by the river.

37. What is the other plot?—The other plot is on the south side of Great George-street, bounded by Princes-street on the west, and the Broad Sanctuary on the south, and St. Margaret's Church on the east.

38. That block also you think it desirable for the Government to take power to purchase?—Yes.

39. If these improvements are carried out to the north of Great George-street the property on the south of Great George-street, you think, will be materially enhanced in value?—Yes.

40. And that therefore it will be right for the Government to take power to acquire the fee simple of that property lying to the south of Great George-street?—No doubt. There is another plot which I think it would be desirable for the Government to take power to take, and that is the whole of Abingdon-street, Great College-street, and the houses abutting upon the Westminster School. The greater part of that property in Abingdon-street belongs to the Westminster Bridge Commissioners; Abingdon-street and College-street, and

H. A. Hunt, Esq.

9 June 1856.

the whole of Dean-street and the houses abutting upon Dean's-yard, are all very close upon these proposed improvements; and I think it would be desirable to include them in any scheme which is formed. Then, on the other hand, you have here a considerable space near the Wellington Barracks, which is bounded by York-street and James-street. Now the Ordnance are enlarging those barracks, and buying the property abutting on York-street from time to time at a very great price, because they have no compulsory power to take the property, and it would therefore be desirable that the whole of that block bounded by York-street should be taken; the Wellington Barracks come up to that point, and the Government should, I think, have the power to take the whole of that block of houses abutting upon the barracks for Ordnance purposes, or for any other purposes that they may think desirable to apply it to.

41. That is the block bounded by the Birdcage-walk on the north, by James-street and York-street on the west and south, and by Queen-square on the east?—Yes.

42. Mr. *Jackson.*] Would you not think it desirable to include as much of the property as would enable you to straighten Great College-street, and make it run into Great Peter-street, so as to give a through communication to that district?—As a public measure that would be desirable; it would be a very near way to Millbank-street and to Vauxhall Bridge.

43. Mr. *Ker Seymer.*] You have spoken of great complaints of want of space in the public offices; would not the fact itself of concentration and better arrangement in part obviate that difficulty?—I do not know that. The Board of Trade, for instance, are very much confined now; they are in a very concentrated condition; they are all in one building, except one or two departments, which are in Parliament-street. I have given you the exact space now occupied by these various departments; and I take it for granted that the persons who occupy those rooms for the public service, whether they are in six houses or in one, will require the same space: I do not think anything will be saved in space by concentrating them, if the rooms are all fairly and properly occupied now.

44. Mr. *Jackson.*] If the Admiralty and the Inland Revenue Department were brought to the same district, would you have sufficient space without purchasing the property behind Whitehall Palace, called Whitehall Gardens?—If you were to remove the Admiralty from its present position to bring it to the same district, I suppose you would want about double the space that we are proposing to deal with now.

45. If it was decided to remove all the departments to the vicinity of the House of Commons, that space would be required as well as the others?—Yes.

46. Mr. *Edward Egerton.*] Can you give us the dates at which these offices were built; can you state how many of them have sprung up within the last 20 years?—I think Mr. Phipps will be able to state that.

47. *Chairman.*] Will you give the Committee the superficial area of those two additional blocks which you think it desirable for the Government to have power to take?—I am not prepared with that now, but I will give it at the next meeting of the Committee.

48. Mr. *Jackson.*] Will you also give the area of the other space which has been mentioned, including the whole of Montagu Gardens?—I will do so.

49. Sir *Archibald Campbell.*] Do you propose to include the space between the Wellington Barracks and Prince's-street?—I should certainly recommend that; when you consider the large number of persons whom you are about to remove from the site shown upon this plan, it is clear that they must be located within an easy distance of the Houses of Parliament; Victoria-street and York-street, and all the immediate vicinity must be used for that purpose; and great improvements must necessarily follow upon this scheme being carried out.

50. Mr. *Jackson.*] And you consider that it would be a great diminution of the total cost, if the Government bought the whole now, even if they re-sold it afterwards?—I think it would; I think, as a matter of commercial speculation, it might be made to pay. I am not, however, able to give a clear general opinion upon that, because it requires some calculation and consideration; but as an abstract proposition I think that would be the case.

51. If you had a joint stock company to deal with instead of the Government, and you got a good rent from the Government for the use of as much of this property as they required, would it, in your opinion, be a good speculation for

for a company to enter into?—It would depend upon what the "good rent" from the Government would be. As a general principle, we know perfectly well that making new thoroughfares in the Metropolis is a very expensive operation and requires a very large outlay, which you never get back again. Therefore, as a commercial speculation by a joint stock company looking for five, or six, or seven per cent. as a dividend, I do not think the scheme would pay. But as to the Government, who desire to provide offices for the several departments, and to improve the neighbourhood and vicinity of the Houses of Parliament and Buckingham Palace, I think it might be done by them without much loss to the country.

52. Mr. *Ker Seymer.*] Do you know, speaking generally, the nature of the tenure of the property in those blocks?—They are freeholds of different persons; I think, probably, a dozen houses, or less, in Great George-street on one side belong to a private individual or his trustees, but there are no great landowners. The Dean and Chapter of Westminster have a considerable property on part of one side of Great George-street and Dean-street, and Abingdon-street belongs partly to them. They bought that by my advice the other day, when the Westminster Bridge Commissioners sold it by auction, because it adjoins the College garden.

53. Mr. *Henry Baring.*] Is it not the fact that Victoria-street is only partially built, and that the part which is built is very partially occupied?—That arises from the circumstance that the Commissioners did not take enough property; they took just as much as would enable them to make the street, with the necessary frontages; but few people will live in Victoria-street overlooking wretched property such as now exists there. If you go up Victoria-street and look down Orchard-street and Duck-lane, and those parts adjoining to it, you will see that it is such that no person with a due regard to his comfort or his social habits would think of residing there; it is a most wretched place, and if the great improvement now proposed should have no other effect, I believe it would be the means of clearing away the whole of that objectionable property.

54. *Chairman.*] What course would you advise should be taken for the acquisition of that property; would you desire, in the first instance, that power should be taken to buy the fee-simple?—Yes, I should venture to recommend that the Government should take power by an Act in the usual way, giving notices to take the whole of this property, or such property as the Committee may think it desirable to take, and that then having got that power they should immediately buy up the fee-simple of the whole of the property of which they desire to make themselves masters.

55. Taking power at the same time to determine the occupation of the lessees?—To buy them up when you require them, because, supposing you were determined to carry out this great scheme, it would not be done at once. It seems to me desirable, in the first instance, that the Government should acquire the fee-simple; of course, you would not require to pull down the whole of this property at once, the new buildings would be required in sections; probably you would find it expedient to begin at Downing-street, for the Foreign Office and the other buildings which are urgently required, upon the property lying nearer to the Park, so as to leave Parliament-street and Bridge-street for as long a period as you possibly can; but I think you ought to buy the freehold at once, otherwise you will have to pay a much larger price for it when you want it, because if you only buy the freeholds as you pull down, of course you raise the value of that which you leave, but if you buy it all at once, and settle the whole thing before any fictitious value is given to it, then I think you do the public great service.

56. Mr. *Edward Egerton.*] Have you made any estimate as to the probable cost of the whole scheme?—I have made an estimate of the probable cost of purchasing all the interests in the property delineated upon that map. The dark parts on the Plan are already public property; excluding the block on the south side of Downing-street, the vacant piece of ground and the buildings now occupied by the Government Offices in Downing-street, and also excluding from my estimate the property in Crown-street and Fludyer-street (which is marked blue upon this plan), which the Government were authorised by an Act passed in the Session of 1855 to purchase, and part of which has been purchased out of a vote of 30,000*l.*, which was granted in that Session; independently of that, and inde-

H. A. Hunt, Esq.

9 June 1856.

pendently of Richmond-terrace, all the property shown upon the plan before you, may be purchased for 1,503,425 *l.*

57. Is that inclusive of the leasehold interest?—It includes every interest; it includes freehold, leasehold, and trade compensations.

58. Mr. *Jackson.*] It includes all good-wills?—Yes. I can confidently state that I have taken a sufficient number of years' purchase to cover all the interests.

59. *Chairman.*] Supposing that this property was purchased, Government will be enabled to make two great thoroughfares, one from Whitehall down to St. Margaret's Gardens, and the other from the Birdcage-walk to Westminster Bridge, with the destruction of that block of buildings on the right hand side between Bridge-street and Westminster-hall?—No doubt. It should be observed with reference to this estimate which I have now given you, that it includes the property on both sides of Bridge-street, which I should think would, under any circumstances, be required for the improvement of Westminster Bridge; and, therefore, I think it is hardly fair to bring it into this estimate in relation to this improvement, nevertheless I have included it.

60. Mr. *Jackson.*] Can you state, in a round sum, the amount that ought to be deducted off this 1,503,000 *l.* for the purchase of this property, as belonging more to the Houses of Parliament and Westminster Birdge than to this scheme?—I am not acquainted with the requirements of either; I do not know, for example, whether one side of Bridge-street might be required. The south side of Bridge-street and New Palace-yard would cost 122,500 *l.*

61. Supposing that property was not purchased for the purpose of this improvement as connected with rebuilding the Government offices, that would reduce the estimate about a quarter of a million?— About that. Then there is another deduction which might be made; Government has bought the Westminster Bridge property, a considerable portion of which is in this block, and that would reduce the estimate 90,000 *l.* Upon this plan the Westminster Bridge property is coloured red; that the Treasury have paid or are about to pay 90,000 *l.* for. That does not represent the entire value of the property; it only represents the interest the Westminster Bridge Commissioners had in it, subject to leases which had been granted by the Westminster Bridge Commissioners.

62. Then your rough estimate of 1,500,000 *l.* will be reduced about 300,000 *l.*, if we take off the property which is already about to be paid for by the Treasury, and the two sides of Bridge-street?—No doubt.

63. And if also the other improvement which is contemplated, of widening Parliament-street, and for that purpose taking the property between Parliament-street and King-street, is deducted, that would leave a still less amount chargeable against the public offices?—Yes.

64. What amount would you estimate that at roughly?—All the property lying between Whitehall, Great George street, Parliament-street, and the east side of King-street, would cost 353,850 *l.*: then the present rental of the public offices, rented by the Government, of about 30,000 *l.* a year, represents, in round numbers, a capital of a million of money. Then the buildings now occupied by the public offices, which we shall bring to this spot, will be vacated, and the buildings which are not rented will of course produce something: I do not know what they are, but they will produce something if they are sold. Take for instance the old Ordnance Office; suppose you bring that office on to this ground, you will have that ground to sell.

65. Have you any statement that you can lay before the Committee, of the quantity of property that will fall into the hands of the Government that might be sold when the transfer of the public offices takes place to this district?—No, I could not state that, until I know accurately what will be put upon this ground.

66. You have enumerated most of the public departments, with the exception of the Admiralty and the Inland Revenue; assuming that they are all brought to this neighbourhood, what amount of property would fall into the hands of the Government which they could dispose of, and what, in your opinion, would be the value of that property to come in reduction of the cost of this scheme?—I have not a statement of that kind before me, but I will endeavour to obtain the information.

67. Would you be able to furnish the Committee, when you come before them again, with a statement of the approximate cost of the whole of the property

property which has been named to-day in addition to the block upon your plan? —Yes; approximately I shall be able to state it; but I am afraid I could not give in any detailed plan, such as you have before you, without some further time. *H. A. Hunt*, Esq. 9 June 1856.

68. Will you also give us a statement, deducting that which would be required for other purposes apart from the public offices, and will you give us also an approximate idea of the value of the property which would be released from its present use as public offices, and which might be sold in reduction of the costs of the new buildings?—Yes.

69. Mr. *Henry Baring.*] Your estimate of a million and a half is solely for the purchase of the ground?—Yes.

70. It has nothing to do with the erection of the buildings?—No; but it includes the purchase of every interest; I could give you an approximate amount for the buildings.

71. Mr. *Jackson.*] That of course would depend upon the space you have to cover?—Yes.

72. *Chairman.*] And it must depend upon the design very much?—Very much.

73. Mr. *Jackson.*] Shall you be able, at the next meeting of the Committee, to give us an idea of the result of the whole operation as regards cost, supposing the whole of the property which has been mentioned to-day were purchased, and making the deductions which have been pointed out?—That is to say, as regards the deduction for the present public offices, what is the value of the public buildings which will be vacated if they are concentrated upon this ground, added to the capital sum which 30,000 *l.* a year represents in the shape of rental. I shall be able to ascertain that when I get the necessary information, but I do not know, for example, whether the Ordnance Office belongs to the Government or to the Land Revenue.

Lunæ, 16° *die Junii*, 1856.

MEMBERS PRESENT.

Sir Benjamin Hall.	Mr. Edward Egerton.
Mr. Jackson.	Mr. Cardwell.
Lord Claud Hamilton.	Mr. Henry Baring.
Mr. Stirling.	Earl Grosvenor.
Sir Archibald Campbell.	Colonel Greville.
Mr. Archibald Hastie.	

THE RIGHT HON. SIR BENJAMIN HALL, BART., IN THE CHAIR.

Henry Arthur Hunt, Esq., called in; and Examined.

74. *Chairman.*] AT the last meeting of the Committee you were requested to be prepared to-day with an estimate of what you considered would be the probable cost of acquiring properties which were mentioned at that meeting; will you state to the Committee what you consider the value of those properties, setting them forth separately?—Taking the south side of Great George-street, bounded on the west by Princes-street, and on the east by St. Margaret's Garden, and on the south by the Broad Sanctuary, including all the buildings, except the Hospital, the Sessions House, and the Stationery Office, comprising an area of 67,856 feet, I estimate the cost of the property at 162,000 *l.* Then on the other side of Westminster Abbey, for the property lying between Poet's Corner on the north, Wood-street on the south, the River Thames on the east, and Great Smith-street and Dean-street on the west, including in that block the Canons Houses and Westminster School, and the College, comprising an area of 633,750 feet, the estimated cost is 747,450 *l.* Then with reference to the other block near the Wellington Barracks, the property bounded on the south by York-street, on the north partly by the *H. A. Hunt*, Esq. 16 June 1856.

H. A. Hunt, Esq.

16 June 1856.

Wellington Barracks and partly by the Bird-cage Walk, east by Queen-street, Queen-square, and west by James-street, Buckingham Gate, taking the block from the old Stationery Office to the opening in Queen-square, into the Bird-cage Walk, the estimated cost is 206,150 *l.*, and the area is 180,000 feet. Then continuing that block from Queen-square on the west up to Princes-street on the east, Bird-cage Walk on the north, and Tothill-street on the south, that is, in fact, taking the block from Queen-square right down to Westminster Hospital, comprising an area of 350,000 feet, the cost is 641,900 *l.* Then the last estimate I was desired to make was for the block from Richmond Terrace on the south, to the rear of Whitehall-place on the north, the river on the east, and Whitehall on the west, taking the whole of Privy Gardens; the superficial area is 360,000 feet, and the estimated cost is 1,126,000 *l.*

75. What is the total amount of the whole?—£. 2,883,500. There was some other information which I was desired to give, with which I am now prepared. I was desired to state the area of Somerset House; it is 225,000 superficial feet; the superficial area of the Admiralty is 50,000 feet. There was also inquiry made as to the period at which Lady Dover's lease will expire; I find it expires on the 10th of October 1883, and the rent reserved is 760 *l.* per annum; it belongs to the Crown.

76. Mr. *E. Egerton.*] When was that lease renewed?—I do not know the time.

77. During Lord Melbourne's government?—I have understood so. Then I also alluded to the value of the property now occupied by the departments, which would be transferred to the new site. I expected that that would have been a much larger sum than it is. I find that, with respect to those buildings which I have enumerated in my list, which are now occupied by the departments that will require accommodation in the new site, the Office of Works have no freeholds in that list at all. All of them that are of any value are held on lease from the Commissioners of Land Revenue, and the Commissioners of Works and Public Buildings pay a rental for the same. Valuing the interest which the Office of Works have in that leasehold property, I estimate that it would realise the sum of 82,300 *l.*

78. Mr. *Jackson.*] That is the total deduction that you can make as against the cost of the new offices?—It is. There is another point which I wish to mention to the Committee. It will be in the recollection of the Committee, that I stated that the rentals now paid for offices in various parts of London reached 30,000 *l.* Since that I have, with the assistance of Mr. Phipps, gone into that question, and I find that, in respect to the offices enumerated in my list, 22,000 *l.* only is applicable to offices that will be transferred to the new site; the rest of that sum is applicable to offices which will not be transferred to the new site—at least we have not considered them in the previous calculations as being transferred to this site. It would not be fair to bring that 30,000 *l.* into the calculation. I have taken it at 22,000 *l.*, and capitalising that at 30 years' purchase, would give the sum of 660,000 *l.* Then the value of the leaseholds I estimate, as I have stated, at 82,300 *l.* Then part of the property included in my original estimate of 1,500,000 *l.* is property which would be required, under any circumstances, for the approaches to Westminster Bridge, and for improving the north side of the New Palace Yard, by the Clock Tower. That clump of buildings must come down for one or the other, and it would have to be purchased for that purpose, if not for this. The deduction on that account from the total cost of this site, is 250,000 *l.* So that, in point of fact, although this property will cost 1,500,000 *l.* to purchase, we shall save, by capitalising the rentals, and by giving credit for the property that will be required for other purposes, 992,000 *l.*

79. Sir *A. Campbell.*] Do I rightly understand that you estimate the block of buildings between Bridge Street and New Palace Yard at 250,000 *l.*?—No, at 122,000 *l.*; but then there is the other side of the street as well. You cannot get good approaches to the bridge, and leave the other side of the street standing: both sides must come down; that has always been contemplated; so that, in point of fact, instead of this site costing the country 1,500,000 *l.*, it will not cost above 500,000 *l.*, if you give credit for those things.

80. Mr. *Jackson.*] Do you only estimate for an amount of accommodation equal to the present requirements of the Government?—No. Taking the whole area

area comprised in that map, which I have estimated at 1,500,000 *l.*, that would leave a surplus of 90,000 feet.

81. You state that 22,000 *l.* a year is the rental which is now paid for property which is now used for the purposes of the Government, and is not sufficient for those purposes; if therefore the Government required double the space for offices, they would, of course, have to pay double the rental?—No doubt.

82. If you double the rental, it would increase the amount of saving by 660,000 *l.* more?—That is assuming that the Government requirements would occasion a doubling of the rental.

83. In your estimate of the expense of the new offices, you have taken only the purchase of the site, while, on the other hand, you have taken the value of the buildings now occupied?—Yes; I am speaking of the value of the ground; you have to add to that the value of the buildings, and that, of course, as I stated at the last meeting of the Committee, will depend very much upon the architect and upon the plan, and so on.

84. *Chairman.*] Have you been able to make any calculation as to what would be the probable cost of covering that area, which you have described, with buildings for Government purposes?—I have taken the same area to be covered which is now occupied by the departments I have mentioned, and I think that, to give them the accommodation stated in the paper I gave in, would cost a million of money for the buildings.

85. Mr. *Jackson.*] Then it would stand thus: the cost of the property originally stated by you—the first plot indicated in this plan—would be 1,500,000 *l.*, to which you would add, for the construction of buildings, 1,000,000 *l.* more, making 2,500,000 *l.*, and from that you would deduct 992,000 *l.*?—Just so; in fact, 1,000,000 *l.* in round numbers.

86. Making the total cost of the new offices, including the site, 1,500,000 *l.*?—Yes.

87. Mr. *E. Egerton.*] And that would be for providing very little more accommodation than at present?—The same exactly, but leaving some ground for further accommodation.

88. Mr. *Jackson.*] What would you value the excess of ground at which would go in reduction of the gross sum?—I am not prepared to give you that very accurately.

89. Assuming that the surplus property which you would not require for the purpose of giving the same amount of accommodation which the Government now possess to be worth 500,000 *l.*, it would bring the total cost of the new building down to 1,000,000 *l.*?—Yes.

90. The present rental of the offices now occupied by the Government for which they pay rent being 22,000 *l.*; if you deduct the value of that rental, the Government would then have for 1,000,000 *l.* concentrated accommodation for the public offices close to the Houses of Parliament, besides improving all the approaches towards the Houses of Parliament and Westminster Bridge; would not that be the result?—Not quite that, because this 22,000 *l.* you have capitalised as a saving; you do not get the money. It would stand thus: my estimate is 1,500,000 *l.* for the ground in round numbers; then I say that you have the deduction of the 666,000 *l.*, and you have 330,000 *l.* saved in other ways. It would be 1,170,000 *l.* for the ground; then the buildings would cost 1,000,000 *l.*; then you must deduct from 1,000,000 *l.* the money that you would save in those rentals.

91. What would be the result?—That would be 1,500,000 *l.*

92. Mr. *Cardwell.*] You mean that you would deduct 1,000,000 *l.* for the saving, and that that leaves 1,500,000 *l.* of actual expenditure?—That is what I mean; 1,500,000 *l.* of actual expenditure.

93. Mr. *Jackson.*] How much would that be reduced by the property which you would not cover, and which might be disposed of?—I cannot tell without calculations.

94. But the 1,500,000 *l.* is reducible by the value of the surplus property which would not be required?—Supposing that you require no more space than is occupied at present.

95. Mr. *E. Egerton.*] When you estimate the cost of the building at 1,000,000 *l.*, what style of architecture do you contemplate?—I suppose an elaborate Italian building.

H. A. Hunt, Esq.

16 June 1856.

96. Like the present face of the Treasury?—Something of that description; of course it must be an approximate estimate.

97. Mr. *Jackson.*] I suppose you have taken the cubical contents, and arrived at the result in that way?—Yes.

98. Mr. *H. Baring.*] You contemplate three stories?—I do not contemplate three stories in the calculation of the area; I take the total superficial area that is now occupied; and then calculate the cubical contents of the proposed buildings.

99. Mr. *E. Egerton.*] How many stories are there at present?—The Board of Trade has three stories above the ground.

100. Mr. *Jackson.*] In your calculations of the cost of the building, you have merely calculated to cover the same amount of space which is now occupied?—With buildings.

101. And you have made no calculations, supposing the increased wants of the Government should require double that quantity of accommodation?—No.

102. Have you space enough in the 969,000 feet of ground which you propose to take to double the present accommodation?—That depends upon whether you put up buildings three or four stories in height, and what you give for open spaces; I stated that probably one-half would be given. That would depend very much upon the architects who make the designs; if it were more or less, a greater or less quantity of ground would be taken.

103. Taking it at one-half, what excess of superficial area would you havehe spare after providing an amount of accommodation equal to that given by the buildings now occupied?—I have stated in my evidence previously, that if the buildings were three stories in height, there would be 90,000 feet to spare, and with four stories there would be 170,000.

104. There would not be sufficient to double the present accommodation?—No.

105. Which of the five blocks of property which you have described would, in your opinion, be best adapted for Government offices, in the event of more being required than 960,000 feet?—That on the south side of Great George-street would, I think, be adapted for such a purpose. It would not be concentrating the Public Offices if they were taken down into Abingdon-street. But the concentration of the Public Offices between the Broad Sanctuary and Whitehall would be complete, taking the south side of Great George-street, and all the buildings except the Hospital and the Sessions-house.

106. Lord *Claud Hamilton.*] In your calculation of the space which would be required, have you taken off anything in consideration of the reduction in the number of clerks or servants that might be made in consequence of having establishments connected with the same department all under one roof?—No, I have not.

107. But there may be in that way a saving of some available space?—I think that is more a question of supervision and control than of a saving of expense; because the messengers who go from the Ordnance Office in Pall Mall to the War Department in Privy-gardens are mere servants carrying papers; probably some of the heads of departments may have to go from Pall Mall occasionally to see the Secretary of State for the War Department in Privy-gardens. But with respect to the clerks and persons who have accommodation in those houses, it is fair to presume that in every house that I have taken, all the rooms in the house are occupied; and, if that be so, you must have the same amount of square feet for them in the new buildings, supposing those buildings were all put together.

108. If there were five different houses under one department, in each of which there were certain portions of correspondence carried on, must not that necessarily give rise to more writing, and require a greater number of clerks than if it was all concentrated in one building?—I am hardly the proper person to give an opinion upon that point, because I do not know how the correspondence is divided, and what inconvenience that may cause.

109. Mr. *Jackson.*] Can you state the area upon which the Horse Guards stands?—Forty-eight thousand square feet.

110. Then if the Admiralty, the Inland Revenue and the Horse Guards were concentrated within the proposed buildings, you would require a superficial area of 323,000 feet more to give them the same accommodation which they possess now?—Yes.

111. Then

111. Then it would be necessary to provide a greater extent of ground than that which you have first stated, in the event of those departments being brought into the same range of buildings?—I think that follows. These areas which I have given you are the areas on the ground, not the areas of the rooms of the several floors; they are merely the area of the ground occupied, in comparison with the area of the ground which you would obtain by removing all those buildings.

112. *Chairman.*] Assuming that it shall be deemed desirable by the Committee to concentrate all the public offices, or as nearly as possible all the public offices, in one locality, and that the House of Commons should sanction that proposition, what is the extent of ground that you would consider absolutely necessary for the Government to acquire?—The extent of ground which the Government should acquire would be all that block to which I alluded on Monday last.

113. That is, all the block from Downing-street and the back of Richmond-terrace on the north, to Westminster-hall and Great George-street on the south, and from the Thames on the east to the Park on the west?—Yes.

114. That you consider absolutely essential?—I do.

115. Then, with regard to the south side of Great George-street, do you think it would be convenient and desirable that that plot of ground should also be acquired; and if so, will you state your reasons for thinking so?—I think it would be desirable to acquire it; because, in the first place, it would afford additional accommodation to the Government: secondly, it would enable the architects to deal better with the whole site in connection with Westminster Abbey and the approach to the Houses of Parliament, and the inclosure of the Canning statue, and other things; it would enable you to make a better approach from the park, and altogether I think it would be desirable that the Government should have it.

116. I apprehend that if the power is not taken to acquire it in the first instance, the value of the property will be materially increased by the adjacent improvements?—Vastly.

117. Lord *C. Hamilton.*] Have you made any calculation of the available space at Somerset House, or do you presume that those offices are to remain where they are, in your calculations?—Yes; I have not assumed that any of the departments which are carried on there will be brought to this site.

Sir *Charles Edward Trevelyan*, K.C.B., called in; and Examined.

118. *Chairman.*] THIS Committee is appointed to consider the best means of providing accommodation for the various public departments in the neighbourhood of Downing-street, with a view to concentrating them in some convenient locality; can you give any information to the Committee as to any economy, or any increased efficiency as regards the public service, that would be derived from any such concentration?—My attention has been directed to the subject, in the execution of my public duties, for many years past; and I have long formed a very decided opinion that, next to the appointment of proper officers, the thing most conducive to the public service will be to have proper offices. In January 1854, being appointed with Sir Stafford Northcote on a Committee to inquire into the establishment of the Office of Works, we took the opportunity of submitting our opinion on the subject, which I beg leave to put in.

[*The same was delivered in, and read, as follows:*]

WHILE we are adverting to the duties of the Office of Works in connexion with the care of the public offices, we think it well to take the opportunity of urging the great importance of introducing more economy into the system of providing the public departments with accommodation. At the present time more than 15,000 *l.* a year is paid as house-rent for premises occupied as government offices. These premises are often exceedingly inconvenient. Having been constructed with a view to private occupation, they are never perfectly well adapted to the arrangements of an office; some of the rooms are unnecessarily large, others inconveniently small, and there are always several rooms in each house which are not fit for use as official apartments at all. An additional inconvenience results from the circumstance, that some of the houses do not correspond in size with the departments to which they are assigned. The Board of Works itself is a case in point. The house occupied by the chiefs of the establishment will not contain nearly all the subordinate officers, and,

Sir *C. E. Trevelyan*, K. C. B.

16 June 1856.

and, at the present time, the department is actually divided among three distinct buildings, situated at some distance from each other. Those who are conversant with the details of official business will at once perceive how great a loss of time this separation must cause, and how much it must tend to render an increased staff of officials necessary. One clerk in a well-arranged office, with ready access to all its papers, and in constant communication with his superiors, can do nearly as much work in a day, as two who are placed in distinct buildings, separated from each other, from their chiefs, and from the records of the office.

The sum now paid for the rents of offices represents the annual interest of a capital of more than 500,000 *l.* We are induced to believe that a much less sum than this would be sufficient to provide for the erection of a range of offices capable of containing the whole of the departments now in want of accommodation. Such offices would be less expensive and troublesome to keep in order than the detached and unsuitable premises now in use. There would be no waste of room in them. They might be so contrived as to bring several departments which are in relation to one another into close neighbourhood, and so facilitate the transaction of business between them. They would prove advantageous to the public, who are frequently obliged to go from one department to another, at considerable inconvenience. They might be made to include a common library, common waiting-rooms, a common staff of office-keepers and housekeepers, and many other advantages, which, though apparently trivial in detail, would in gross be productive of a large saving.

We therefore, strongly recommend this point to the attentive consideration of the Government.

In answer to the question of the Chairman, I will apply myself first to the question of economy: the principle on which the public offices have hitherto been accommodated has been that of placing them in private houses. That necessarily leads to great and unnecessary expense; the houses have been constructed as private dwellings; they contain basement floors and garrets which, although perfectly suited to private purposes, are unsuited to public purposes; there is consequently much waste. Then each separate house contains a separate staircase and hall; and when several adjoining houses are occupied by public offices, the extra staircases and halls are so much waste. Indeed, as offices can be constructed with a single staircase to answer for a very large number of rooms, everything over and above that is waste. Then, as the offices are put into separate private houses, it seldom happens that the office exactly fits the house. The house is almost always either too small or too large; generally speaking, it is too large; and there is a great deal of waste in that way. I have known many instances of offices, with small establishments, being put into houses much too large for them; which also creates a temptation to occupy parts of the houses as private residences. Then another prevailing cause of waste is, that the rooms which are occupied in those houses for public purposes are not suited to the purpose; they consist generally of large drawing-rooms and dining-rooms, and smaller bed-rooms and studies. The chiefs of the office generally take the best rooms, the large rooms, and one often sees the chief or the secretary of an office establishment sitting alone in a large drawing-room, and the clerks are put into smaller rooms as may be. Another consequence of having a separate house for every separate office is, that it is necessary to have what is called a separate domestic establishment; that is, a separate office-keeper, separate messengers, and a separate housekeeper for each house. We had a singular instance of that in the building occupied by the Council Office and the Board of Trade. Some years ago, when we received a pressing application from the Board of Trade for more accommodation, we inquired into the appropriation of the existing accommodation, and we found that a very extensive basement story, extending the whole length of the building, and also extensive upper stories, were occupied by two office-keepers and two housekeepers; as these were not husband and wife, there were four separate private establishments; that is, each of the two housekeepers, and each of the two office-keepers (indeed there were three housekeepers, for the Board of Trade has two) had separate private establishments of their own, not only occupying this valuable public accommodation, to supply the place of which the public had to be put to great additional expense, and each drawing a separate salary, but consuming Government coals, Government candles, and various other articles of furniture and consumption of that sort. That building was erected originally for a public office: it was one of the few public buildings that have been erected for public offices; but its construction was so defective, and so much in accordance with the old principle of a private residence, that even after its reformation by Sir Charles Barry, it is very imperfectly suited to public purposes;

Sir C. E. Trevelyan, K. C. B.

16 June 1856.

purposes; the basement story and the upper story are still very insufficient So that one great saving by consolidating public offices will be by consolidating and diminishing their domestic establishments. The Chairman is aware that we have lately taken a step in advance upon this point, by putting the domestic expenses of all the offices under the superintendence of the Office of Works, to the extent of requiring that all those different articles shall be obtained on specific requisitions, and shall be supplied by the Office of Works on general contracts, instead of each office providing them separately for itself; but we ought to go beyond that, and to place the purely domestic establishments, the cleaning the rooms, and the lighting, and warming and airing the rooms, and all that class of business, entirely under the Office of Works. But the great saving of all will be in the consolidation of the public establishments. I may best illustrate that by two or three instances: numerous separate pay-offices have been consolidated into one Paymaster-general's office; and by that measure the saving in establishments alone, that is in superior officers, paymasters and clerks, has been at the rate of about 40,000 *l.* a year. It is so much easier to get work done regularly and properly, by means of a consolidated arrangement, than by the scattered arrangements that existed previously. There were, for instance, two Paymasters of Exchequer Bills, and a number of clerks; we placed them all on the retired list, and we do the business by the existing establishment of the Paymaster-General's Office; that is only one instance in point. Then the Ordnance account business, both cash and store, was all done at the Tower; of late years we have consolidated that with the other superintending establishments at Pall Mall, previously to the consolidation of the different departments which now constitute the War Department, and a very considerable saving of establishment was effected by that means. The Boards of Stamps and Taxes, and the Excise and all their great establishments, have been consolidated at Somerset House, and a further large saving was thereby effected; and there is no doubt that as the different departments are more brought together, further additional savings of that kind may be made. Another saving will be in the rent of the houses; for the present imperfect accommodation we have to pay very high rents. Whenever we go into the market to hire a private house, we have to pay the full market, or more than the market rate; for the War Department alone, we are at this moment paying about 4,000 *l.* a year; my figure is 3,706 *l.* a year, but that is not the whole; and while, on the one hand, we pay tip-top market or fancy rates for hiring houses, on the other we know by experience that we are able to build by contract at fair moderate rates; and we shall save not only by consolidating our accommodation and substituting better accommodation for our present imperfect accommodation, but we shall save in the actual ground rents. This 4,000 *l.* a year rent for the War Department, I imagine, is chiefly in the nature of ground-rent; that is, it is chiefly for low buildings on expensive sites; and if for them were substituted lofty buildings of several stories, we should save very much in that way. It will be seen that Sir Stafford Northcote and myself calculated that the sum then paid for the rent of offices represented the annual interest of a capital of more than 500,000 *l.*; that sum being calculated on the payment of 15,000 *l.* a year as rent. That was the first calculation of the kind that had been made, but it was very much under the mark; and, including all the legal and other public offices, which have since been considerably increased, I should say it would come much nearer to 30,000 *l.* a year, than 15,000 *l.*; and of course the capital sum represented by the annual expense would be increased in proportion. Those are all the remarks I have to make on the subject of economy.

119. Then as to efficiency in the transaction of business, what is your opinion as to the effect of the concentration of the public offices in that respect?—It is difficult to reduce the subject of efficiency to any precise test; but there is no doubt that great as the saving will be in point of pecuniary economy, the advantage to the public interest in point of increased efficiency from having the public establishments consolidated, will be greater still; the business will not only be cheaper done, but it will be much better done. In the first place, the general effect of the change will be to substitute personal communication for written correspondence. Not only is a very large written correspondence kept up among all the different offices, but in several departments there is a similar correspondence constantly going on between two or more branches of the same establishment. For instance, until the cash and store account department of the

Sir *C. E. Trevelyan*, K. C. B.

16 June 1856.

Ordnance at the Tower was consolidated with the department at Pall Mall, they were constantly corresponding, and the valuable time of the superior account officers was wasted to a lamentable extent, in going to and fro. They were continually going between the Tower and Pall Mall in hackney coaches and cabs, with their account-books and other documents. The same thing is going on to this day, to a great extent, between the Account Departments of the Admiralty at Somerset House and the Superintending Department at Whitehall. But perhaps the best way of expressing my opinion of the importance of the change in this respect, will be to say that there can be no efficient control, unless the departments are brought into personal communication. I will instance the great revenue departments. One of the greatest of the important financial reforms which have been made of late years in France, has been to bring the Directions of the Taxes, which answer to our Revenue Departments, under the same roof with the Superintending Department, the Treasury; and until the same thing is done in England, there will be no efficient control over the Revenue Departments. At present the Treasury and the great Revenue Departments are like a head separated from its body. Of course, any evil that would arise from this want of proper detailed knowledge and particular superintendence is very much modified by the honesty and fidelity and public spirit of the subordinate establishments; but still it is a great evil. It is not sufficient that the Treasury should judge merely on the written reports furnished by the Revenue Departments: it ought to have a detailed, personal, particular knowledge of the interior machinery of those departments, so as to be able to form an independent judgment of its own, on each case, as it arises. There is also a very important view as regards the convenience of the public. I have spoken hitherto merely of the increased facility and accuracy of transacting public business; but it would be a great convenience to the public, if those who have to transact business at the public offices found them all in one place. It often happens that the same person has to transact business with more than one branch of the same department. The same business is also often connected with more than one department. I will instance the case of the Pay Office. The accommodation to the public has been greatly increased by consolidating all those different Pay Offices. It is particularly necessary that the Pay Office should be in a central situation in immediate connexion with the Treasury; but I may mention that nothing can be more imperfect than the accommodation afforded by the Pay Office as a building. Any member of the Committee who goes to the Pay Office, and goes into the rooms, which have to be resorted to by hundreds and thousands of persons will see at once that the building is in a state which is totally unsuited to the business: it does not at all afford to the public the accommodation which it ought to do.

120. Mr. *Jackson.*] I gather from your remarks, that you consider that the Treasury and the Inland Revenue Department should be under one roof?—Yes, I am of that opinion; I look forward to that as an ultimate result; of course there are many things that are more pressing.

121. But taking that by itself, you would recommend that?—Yes.

122. Now, take the War Department; you would recommend all the offices connected with that department, which are now separated, including the War Office and the whole of the Horse Guards, to be all consolidated together?—Yes; all the offices connected with the War Department, which are now in 11 or 12 different places, certainly ought to be consolidated under one roof. The Pay Office is common to the War Department and the Admiralty, and all the public offices; and therefore that should be in the most central situation.

123. You would also recommend that the Admiralty should be concentrated too?—Yes, I think that it is of much public importance that the great account and store establishment of the Admiralty at Somerset House should be consolidated with what is called the Whitehall Branch of the Admiralty, that is, the superintending branch.

124. Lord *Claud Hamilton.*] I understood you to say, that a saving of nearly 40,000 *l.* a year had been made in the Paymaster's Office by the consolidation which has already taken place. Can you give to the Committee the different heads of that saving, so as to enable us to judge whether a similar result would probably follow from a consolidation of other departments, such as the War Department, or whether there was anything peculiarly defective in the constitution

Sir C. E. Trevelyan, K. C. B.

16 June 1856.

tution of the Paymaster's Office before it was consolidated, which would make it an exception to the public offices generally?—I will obtain the particulars. I do not mean to hold out to the Committee that a saving to the same extent, or nearly to the same extent, could be made with reference to all the other departments; but I mentioned that as a striking instance of what may be done by consolidation, even in the way of immediate pecuniary saving, which is the narrowest and least important view of the question.

125. With economy is joined increased efficiency, in your opinion?—Greatly increased efficiency; I may illustrate that by the advantages which we experience every day at the Treasury from having the Home Office, the Board of Trade and the Council Office under the same roof with ourselves; it is of the greatest convenience: if these offices were at such a distance that we had to correspond with them in writing about every thing, it would lead to a great waste of time and to great delay.

126. Take the War Department, in connexion with which there are eight or 10 different offices, with their different sets of clerks, and it is sometimes necessary to refer to three or four of them, in order to complete a transaction; now if they were all consolidated into one building, would not that enable a saving of many clerks to be made in each separate house where there is now a department, and might not probably some chiefs of departments be dispensed with if they were all put under one roof?—One saving that would certainly be immediately made would be of the persons now employed in corresponding and going about between those different branches; for instance, the Secretary of State has his office in a building separate from all the others, so that the principal officers of every one of those 11 or 12 branches have to resort to him and waste their time in attendance upon him; because of course they cannot always see him at the moment. But the saving would go much beyond that; in proportion as the offices are consolidated under the same roof, and in adjoining rooms, a better division of labour may be established; it will be seen more plainly what branches of business are analogous; in many cases it will be found that the same thing is done twice over; in many cases it will be found that the same thing is done better in one place than in another, and the better plan will be adopted. Indeed that, perhaps, is one of the most important points of view in which consolidation is of public value; the different public departments at present are in a great degree strangers to each other; the Admiralty at Somerset House, for instance, is to the Treasury, as far as intimate knowledge is concerned, much as if it were a foreign department in Paris or Vienna: we do not know the interior of it, and the relation between it and the War Department is much the same in that respect.

127. Mr. *E. Egerton.*] Surely that is the fault of the individuals at the head; do not they sit as members of the Cabinet?—Yes; but the Cabinet Ministers cannot go into the details of the administration of business. Much the greatest portion of the time of the 1,200 or 1,500 clerks employed in those two departments is taken up with work which is more or less in the nature of routine, according to prescribed forms. Now I have been very much engaged of late years in assisting in inquiries into the public offices, and I have constantly found that similar operations are performed according to a simpler and better mode in some offices than in others; that result has been ascertained by Committees going about and inquiring into the different offices; but when the different offices are brought next door to each other, and obtain a more intimate acquaintance with the details of each other's business, those communications will be of more frequent occurrence, and there will be more of a common understanding between the different departments, which will be greatly conducive to the public service.

128. How long have you filled your present office at the Treasury?—Seventeen years.

129. During those 17 years has not there been a great multiplication of public offices?—Yes.

130. Has not there been an enormous quantity of business withdrawn from the Home Office, and fresh offices created out of the Home Office?—Yes, that has been the case both in that and in other departments; there has been an increase in the number of offices, and at the same time the business of many of the old offices has greatly increased.

131. Has not the multiplication of those offices led to much greater diffuseness in the way of keeping the accounts, and everything of that sort; when the

Sir C. E. Trevelyan, K. C. B.

16 June 1856.

whole of the business connected with the internal administration of the country was under the same office, were not things conducted in a much conciser and more compact form?—A large proportion of the administrative business of the country was never under the Home Office. This is such a self-governing country, that the establishment of the Home Office is very small, and the offices which have been added to it have mostly been created to attend to new business—the Inspectorships of Factories and Mines, Poor Law, Registration, and various things of that kind.

132. You contrasted the very high rent which you say you are now paying for different offices with the expense of this proposed building, which you stated might be constructed at a very moderate rate; do you state it as your deliberate opinion that the public have generally been able to build at a very moderate rate?—I state it as my deliberate opinion, that, with proper precautions, there is no difficulty in doing that.

133. Does not the very building we are now sitting in supply an instance to the contrary?—This building has been constructed under very peculiar circumstances; there have been a great many authorities to be consulted with reference to this building.

134. Will not that always be the case with every Government building?—I think not. We have been continually improving in the transaction of public business; and if what is now proposed to be done, with reference to the public offices, be done, namely, that general specifications of what is required should first be furnished to the architects, and that when a plan and elevation have been resolved upon, after full public discussion and mature consideration, detailed specifications and working drawings should be made, with a view to the contracts being put up to public competition in suitable proportions, under the personal individual responsibility of the First Commissioner of Works, I think it will be practicable to get the whole accomplished at a fair and moderate expense. The competition for the architectural designs should be open to the architects of every country, in order that no means may be neglected of obtaining the best designs.

135. Then I may infer that none of those precautions have been taken in the case of this building?—I do not mean to make any imputation; we all know that a great deal of money has been wasted; but what I mean is, that it is quite within our power to take proper precautions; and, if we take them, I am satisfied that Government will be able to build as cheaply as anybody these public offices, if the plan of them is properly settled beforehand: it is such a simple and uniform kind of building as to be peculiarly susceptible of economical construction.

136. Can you give me the name of any building which the Government has lately built?—There is the Public Record Office in Chancery-lane; and there is the re-construction of what were called the Royal Mews at Westminster for the Stationery Office; both of those have been very well executed, in a very business-like and satisfactory manner, and I am not aware there has been any undue expenditure; they were both done under the Office of Works.

137. Are they found to answer the purposes for which they are built?—Perfectly; they are both great improvements; they are both well worth seeing; and no doubt further improvements may be made.

138. You said that the alterations in the Privy Council Office were not satisfactory?—I believe that was mainly because the building had been so mismanaged in the first instance that it was impossible to convert it satisfactorily.

139. That was the case of an old building which had been adapted to fresh purposes?—Yes: the Stationery Office also has been reconstructed out of an old building, but the new part bears such a large proportion to the old, that it has been turned out in a very satisfactory manner.

See Appendix.

140. Can you give the cost of those buildings at the Privy Council Office, the Stationery Office and the Record Office?—I can obtain them.

141. Lord *Claud Hamilton.*] With your view of the probability of saving by the concentration of the public offices, by a diminution of the number of domestic servants and clerks, do not you think that in any estimate that may be formed of the cost of the new building that may be erected, we have as much right to capitalize the saving by the diminution of clerks and domestic servants, as we have to capitalize the rents now paid for offices, in order to see the real result of the plan in a pecuniary point of view?—No doubt about it; and

and if the calculation were capable of being made, the Committee would also be entitled to capitalize the far greater value that would be obtained in increased efficiency; but the two first items will be quite sufficient for the purpose.

142. But we shall not obtain a just approximation of the debtor and creditor account of the scheme, without capitalizing the savings?—I conceive that the result cannot be accurately reached by any previous estimate; the numerous private houses in which the public offices are at present scattered, are so ill adapted for the purpose, that it is very difficult to form any estimate of the number of properly constructed rooms that would be required; and the degree to which public establishments can be reduced by consolidation is equally incapable of being ascertained beforehand.

143. Mr. *Edward Egerton.*] Your opinion is, that the whole control of the proposed public buildings, of whatever nature they may be, should be under the Chief Commissioner of Works for the time being?—All civil buildings, I conceive, should be under his control, and in civil buildings I include the civil establishments of the army and navy.

144. What do you mean by "civil"; do you mean the Pay Office?—I mean, first of all, the large establishment which is now called the War Department, which is so far consolidated that it is under one chief, but it is not really brought together.

145. You think that is necessary?—It is very necessary; indeed, considerable inconvenience and confusion in that part of the public business has been caused by a conflict of authorities. The Ordnance, and since that the War Department, have to a certain extent constructed the buildings for their civil establishments in Pall Mall, and elsewhere, out of military funds, and provided furniture out of their own funds—very expensive furniture. When a portion of the War Office establishment was lately transferred to Pall Mall, they were surprised at the great convenience of the furniture; and it was obvious at first sight that if the simple pattern furniture of the Office of Works had been supplied to the Ordnance Department, there would have been a considerable saving. In the same way, the whole of the buildings and furniture and domestic expenses of the great Admiralty Establishments at Somerset House and Whitehall ought to be under the Office of Works; and it would be good economy to strengthen the Office of Works sufficiently to meet those increased duties.

146. Then do I rightly understand you to say, that at the present moment there is power in the head of any department to order any furniture for his own office, without reference to the Office of Works?—Up to the late consolidation of the War Office with the Ordnance, we had not brought all the ordinary civil establishments under the control of the Office of Works in those respects; but directions have now been given for extending that control to the whole of the War Department, and also to the Admiralty; that is quite recent. The extension of the functions of the Office of Works to the buildings and furniture of the Revenue Departments in every part of Great Britain, and to the furniture required for the provincial establishments of the War Department, has yet to be accomplished.

147. Mr. *A. Hastie.*] How many clerks have you at the Treasury?—About 70 permanent officers and clerks.

148. How many of those, from the nature of the work they have to do, require a room for themselves?—Perhaps 12, or 15 at the outside; a very important saving would take place, both in economy and in increased efficiency by a proper arrangement of the establishment. Of late years it has become apparent that the division of labour in the public establishments is very imperfect, especially in those which are, *par excellence*, Government establishments, which are the immediate organs of the Executive Government, the Treasury, the Board of Trade, the Secretary of State's offices, and so forth. Two entirely distinct classes of work exist in those offices; one class of work, which is as important as any in the world, of a highly intellectual and responsible kind; another, which is merely mechanical, or almost mechanical. Those two have hitherto been clubbed together. The consequences, as to the efficiency of the office, and also the economy (but I put the immediate economy as quite a secondary consideration) have been most injurious. Well-educated men, moving in the best society, and in the receipt of good salaries, continually increasing, have been kept for 20 or 25 years together to the merest mechanical copying, so that when they rise to the higher functions of the office, they are often unfit for the duty; with such a

Sir *C. E. Trevelyan*, K. C. B.

16 June 1856.

training, it is not easy that they should be fit for it. Now attention has been paid to the subject, and there is a general agreement that a proper division of labour ought to be made between those two classes of work; but for that purpose the rooms must be apportioned accordingly; for the intellectual work separate rooms are necessary, so that a person who works with his head may not be interrupted; but for the more mechanical work, the working in concert of a number of clerks in the same room, under proper superintendence, is the proper mode of meeting it.

149. If all the clerks who had the more intellectual kind of work to perform had separate rooms given to them, and if all the others who are transacting business of a more mechanical kind were put together in one great room, would not such an arrangement considerably diminish the space that would be required in any new buildings that may be provided?—It would much diminish the space, by furnishing the means of a proper division of labour, and it would make both classes of labour much more efficient. The general scheme of accommodation required for an office is, that first of all there should be one or two central rooms, the floors of which should be well strengthened, because great weights are placed in them, for the registry, and paper, and book department of the office; that is the heart of the office, through which the circulation takes place. Then there should be one or two large rooms for copyists; those also should be as central as possible.

150. But all the copyists should be in one room?—They should all be together in one or two rooms; at present they are scattered all over the office.

151. Which occasions the copying to occupy a larger space than if it were concentrated?—Certainly.

152. Is there any gentleman who is the head or has charge of the copying department, who superintends this business?—In the Board of Trade, which has been revised of late years on the model I am speaking of, that arrangement has been made. The copying is all done in one room, under the superintendence of a responsible clerk, and great improvement has taken place. We are now making the same change at the Treasury.

153. Then if I understand rightly, at the Treasury the chief business of the clerks is correspondence?—Yes; a certain number are employed in preparing the decisions in subordination to the political officers. The Treasury is a superintending office; it has nothing to do with executive details; the business comes before us in a complete shape, in reports, statements, and counter statements. We then frame the best decisions we are able, in subordination to the political chiefs of the office, and that forms the business of a limited number of superior selected permanent officers, assisted by the clerks on the establishment, and what remains to be done is principally of the nature of record, that is, to convert the minutes into letters, to enter the letters in the letter-books, and to make the copies required to be sent with them; there is a great deal of that kind of work. In order to shorten the business, and to furnish necessary explanations, we constantly have to send copies of papers which we receive from one department to another. Lastly, the minutes are converted into our final record, which is called the far minutes, which are drawn out, with an abstract of the previous proceedings, so that all, except the preliminary stage, the preparing the decision, is mechanical or semi-mechanical work. I have not included in this description the keeping of the national accounts, which requires special qualifications of a high order.

154. Then that could all be done in one large room?—The plan actually proposed is to collect all the merely mechanical work in a single room, leaving a certain number of clerks under the superintendence of the superior officers to prepare the minutes, and write the letters; but the entering the letters and making the copies are to be done together.

155. It is with the view of economising space that I am putting these questions; at present you occupy a large space, by reason of each individual having a separate apartment; but if you classify those clerks, and put all that are doing the same thing into one room under proper superintendence, might not the business be better conducted, and, at the same time, a considerable saving of space, and, consequently, of expense, be effected?—There might be a great saving of space, both in the Treasury and in other offices; I may instance the Educational Department of the Privy Council, which consists of a permanent secretary, two assistant secretaries, and about six superior officers, called Examiners,

aminers, and a large number of subordinate clerks, who are employed on what may generally be called routine work. Each of the first mentioned officers ought to be provided with a separate room, while the clerks would work better together.

156. Looking at the department over which you preside; in erecting a new building, what space do you think you would be able to save by a better arrangement and classification; would you be able to save a fourth?—Yes; I should think so. It would, however, be difficult to make a precise estimate, because new duties are likely to be thrown upon us.

157. *Chairman.*] Mr. Hunt has stated to the Committee that he thinks it would be desirable to acquire the whole of the property from Downing-street on the north, and the back of Richmond-terrace on the opposite side of Parliament-street, also on the north down to Westminster Hall and Great George-street on the south, and from the Thames on the east, to the Park on the west; do you think that that would be as good a site as could be selected for the purpose of concentration of the public offices?—Yes; I think that the situation of the public offices has been ruled by the decision which maintained the Houses of Parliament on their old site; it is clearly according to the constitution of this country necessary that the public offices should be in the immediate vicinity of the Houses of Parliament; I have given a great deal of thought to the subject, and formed a very mature, although it may be a very mistaken, opinion upon it, which opinion I will submit to the Committee: I would bring together all the civil establishments, except those which are of a local nature, (for instance, those that are required for the local collection of the Customs and Excise, and so forth), in the neighbourhood of the Houses of Parliament. I would extend the existing range of public offices from the corner of Downing-street to the corner of Great George-street; and would erect a lofty and handsome range of buildings forming a large oblong, with one of its long sides fronting towards the Thames, and the other towards the Park. Then I would take the Banqueting-house at Whitehall as the pivot of another block of public offices, and would give two new faces to the old Whitehall Palace, extending from the Banqueting-house to the river, one of those faces fronting towards the Houses of Parliament, and the other face fronting towards Charing Cross, a sufficient open space being provided towards Charing Cross by clearing away Fife House, Lord Carrington's house, and so forth. That block of buildings would cover Lady Dover's stables, Gwydyr House, the Out-Pension Office, the large house recently appropriated to the Army Medical Department, and another house lately occupied by Mr. Philipps, also now appropriated to the War Department, and the Exchequer; and that block of buildings, I conceive, might with advantage be appropriated to the War Department. Two things are to be looked to with reference to the War Department; one, to collect together under the same roof all the scattered offices which now constitute that department; the other, to bring them all into immediate connection with the other public offices. I consider the second object to be quite as important as the first. In a general public point of view, I think it is of great consequence that the military administration should be brought under the immediate view and control of the financial and civil administration. It has been pressed upon the Treasury that temporary accommodation should be furnished, at considerable expense, for the War Department, in Pall Mall, in order to concentrate all the offices composing the War Department provisionally in Pall Mall, until a final arrangement is made. I consider that that would be very undesirable, except as the merest temporary arrangement. The providing accommodation for the War Department is the most pressing point, and I think should be entered upon first. The existing disintegration of the department is full of evil and trouble. We have the great advantage of a very fair copy of the original designs of Whitehall Palace, left by Inigo Jones, which are of acknowledged beauty, and would no doubt be placed at the disposal of the architects who would be invited to compete. Great value is to be attached to historical associations. A considerable sacrifice of public convenience has been made, in order that at the head of each annual vote for the new Houses of Parliament might be placed the words, "For rebuilding Her Majesty's ancient Palace of Westminster." As the Palace of Westminster has been rebuilt, so I would rebuild the Palace of Whitehall.

158. Mr. *Henry Baring.*] You say that a considerable public sacrifice has been

Sir *C. E. Trevelyan*, K. C. B.

16 June 1856.

been made for that object; what do you mean?—I mean that if we had selected the site which in the abstract was most convenient for the Houses of Parliament, we should not have fixed upon that site, and that it was mainly in deference to historical associations, that that site was selected. In the same way as the ancient Palace of Westminster has been rebuilt, so I would rebuild, upon the limited plan which I have described, the Palace of Whitehall; for although the associations connected with the Palace of Whitehall are not so ancient, they are extremely interesting, commencing with Wolsey and Henry the Eighth, and comprising the Tudors and the Stuarts and Cromwell, who died there. This would be a second oblong, much narrower than the first. Then for the Admiralty I would erect a third oblong on the site of the present Admiralty and Spring-gardens, most of the houses in which have been gradually acquired by the public, and are at this moment in the occupation, either of the Admiralty or of the Civil Departments. I would bring together there the whole of the Admiralty establishments from Somerset House and Whitehall; that also should have two faces, one towards Charing Cross and Whitehall, the other towards the park. In fact, considerable progress has been made in forming this part of the plan. The Chairman is aware that plans were formed for such a quadrangle for the Admiralty in the year 1853, and they are now at the Office of Works. Then I would take down the screen of the Horse Guards and Lady Dover's house, and throw open the Banqueting House, which would form the park end of Whitehall; and St. James's Park would be opened to the Thames. That I conceive would complete the plan; of course I do not mean that it should all be done at once; and I beg to guard my opinion by making this remark, that I set out with the hypothesis that we must build new public offices; and that as it costs little more to build handsome public offices than unsightly public offices, it is very desirable on general national grounds to take this opportunity of embellishing the town. It is a remarkable opportunity. The general effect of the plan would be, that towards the park we should have a beautiful range of public buildings. Towards the river we should have a grand place; on one side a handsome lofty range of public offices, and on the other side the beautiful river with stone quays, and Lambeth, which would no doubt gradually partake of the improvement. At one end we should have the ancient Palace of Westminster bringing down our historical associations from the times of the early Saxon kings, and at the other we should have the Palace of Whitehall carrying them on to the revolution. My experience leads me to attach great value to improvements of this kind; if they are estimated only by the most vulgar, matter-of-fact test, that of pecuniary value, they amount to a great deal. For instance: supposing this plan of improvement, or any similar to it, or better than it, to be adopted, how many persons would see it in the course of a year, and what would each person give to see it? If you only estimate it at sixpence a head, what an immense sum it would amount to. I would make one closing observation; I consider that we have a very important national duty to perform in this respect; this city is something more than the mother of arts and eloquence; she is a mother of nations; we are peopling two continents, the Western and the Southern Continent, and we are organising, christianising and civilising large portions of two ancient continents, Africa and Asia; and it is not right that when the inhabitants of those countries come to the metropolis, they should see nothing worthy of its ancient renown. Now, I conceive that a plan of the kind which I have sketched (by no means saying that that is the best plan), would answer the purpose, and more especially as it would give the honour due to the focus of all our liberties, of that regulated freedom which we hope will overspread the world.

159. *Chairman.*] I collect from your evidence, that you are strongly in favour of making a concentration of the public offices?—Yes.

160. And that you consider that the offices ought to be concentrated in the neighbourhood of Whitehall, and in the vicinity of the Houses of Parliament?—Yes.

161. And further, from what you have stated, I presume that you mean, that in the first instance, the War Department should be placed on the east side of the thoroughfare of Whitehall?—Yes.

162. At a point commencing near Richmond-terrace, including Montague House, and running up towards Whitehall-place?—No, I did not properly explain

explain myself; I would propose to take the Banqueting House, which faces the Horse Guards and the Park, as a fixed point, and to construct two wings at right angles to it, extending from the road in front of the Horse Guards to the river; so that one wing would cover the site of Gwydyr House and cross the Privy Gardens to Sir Robert Peel's house; the other wing would occupy the side street leading to the Exchequer, and would cover a portion of the site of Lord Carrington's house and the open space between the Exchequer and the United Service Museum, extending to the river. I imagine everybody has agreed that there ought to be stone quays to the Thames, of which this would make the commencement; and that there should be a railway to connect Westminster with the City; and this plan would also furnish a commencement for that undertaking.

163. Mr. *Edward Egerton.*] Do not you think that everybody is agreed that the Thames should be purified first?—The two should go on together; it would be a great saving of national time to have such a railway, and would relieve the overcrowded thoroughfares.

164. *Chairman.*] Then you propose that the War Department should be placed on the side of Whitehall, where the Banqueting Hall now stands?—Yes; commencing from the Banqueting Hall, I would erect an oblong hollow block of buildings; an oblong square, extending from the Banqueting Hall to the river.

165. Then the next point was the Admiralty; you propose that the Admiralty should continue in its present locality, but that it should be extended towards Spring-gardens?—Yes; towards Charing Cross, and backwards towards Spring-gardens. I would have a similar oblong there, only facing the opposite way; one side towards the street, the other side towards the gardens; and the line of buildings between the existing Admiralty and Charing Cross, Drummond's bank, for instance, should be somewhat thrown back, and an opening should be made from St. James's Park to Charing Cross.

166. But you propose that the Admiralty should continue on its present site, extended northward and westward?—Yes.

167. Then, as regards the Horse Guards, you proposed that the Horse Guards should be taken down, and the business of the Horse Guards, I presume, concentrated in the block on the opposite side, where the War Department would be; and that in it there should be an opening from the face of the Banqueting Hall towards the Park?—Yes, facing Buckingham Palace; so that the three palaces would face each other; Whitehall being the connecting link. The business now done at the Horse Guards ought, of course, to be conducted in the War Department.

168. Then you are of opinion that the remainder of the offices should be concentrated in the block which you have previously pointed out to the south of Downing-street, and to the south of the spot where the new block would be formed for the War Department?—Yes; that is between the Treasury and Great George-street in one direction, and King-street and St. James's Park in the other; that would be the largest block; and it would have a large interior space amply sufficient to admit air and light to the whole square.

169. Sir *Archibald Campbell.*] An inner quadrangle?—A large inner quadrangle.

170. *Chairman.*] Then, supposing it to be deemed desirable by this Committee so to concentrate the public offices, and that any recommendation of this Committee in favour of the concentration of the public offices was to be approved by the House of Commons, and steps were to be taken in order that the offices might be so concentrated, what is the course that you would advise should be taken in order that we may have the offices placed in a proper relative position one to the other, and in order that the Chief Commissioner of Works might obtain information as to the amount of space which would be required by the different departments?—I would appoint a committee, composed of persons carefully selected on account of their experience and ability to act as advisers of the Chief Commissioner of Works and of the Government: first of all, as to the relative situations of the different offices, which is of great consequence. They should be built in groups. I have already spoken of the War Department and the Admiralty; next there would be the Treasury group; the Treasury should be the centre of the superintending establishments of the Revenue Departments, and of the financial and other offices immediately dependent upon the Treasury; then round the Home Office should be grouped a number of

Sir *C. E. Trevelyan*, K. C. B.

16 June 1856.

offices which take their directions from the Home Office; and any departments dependent upon the Foreign Office and Colonial Office should be in a similar manner joined to them; the Board of Trade also has a planetary system of its own, comprising science and art, statistics, registration of seamen, and so forth, all of which should be grouped about the Board of Trade; the Pay Office should be put in the most central situation that can be selected with reference to all the establishments, especially those that have the most frequent recourse to it, the Army and Navy, for instance; but it should also be under the same roof as the Treasury. The Pay Office is a branch of the Financial Department, and its consolidation with the Treasury would greatly contribute to the simplicity, economy, and security of our financial arrangements. I think the first function of the committee should be to determine the relative situations of the different offices; their next function should be to advise in what order they should be built; the War Department first, certainly; and the Foreign Office might be simultaneously carried on as soon as the plans are settled. I must further guard what I have said, by observing, that I by no means contemplate that all this should be done at once; I consider it of great consequence that before anything is done, a comprehensive plan should be formed, so that the whole may produce a grand general effect, both as to administrative efficiency, popular accommodation and architectural beauty; but I would build one block after another, as the necessity of the case required, and as Parliament might think proper to furnish the funds. The third function of the committee should be to arrange the interior of each office; they should first of all consider those points which are common to all offices, some of which have been touched upon in my evidence; and after those had been approved of, they should furnish, office by office as required, the particular application of those principles most suitable to the circumstances of each class of offices.

171. Mr. *Jackson.*] Judging from your experience of the past increase of business that has arisen in the public offices, and the present growth of such business, to what extent would you recommend additional accommodation to be provided?—The growth has been very great indeed of late years, the real growth of *bonâ fide* business that requires to be done for the public good; but I conceive that the establishments required to meet that growth may be very much diminished by proper attention to administrative details, of which this is one of the most important; and that as the business of the nation grows on the one hand, so there ought to be a constantly counteracting influence providing proper accommodation, establishing proper securities for the appointment of fit persons, making a proper division of labour, fixing responsibility, introducing improved methods, and all those various operations which, while they facilitate the transaction of business, tend also in a very great degree to diminish the number of persons required to perform it. The tendency of all our proceedings should be to have few, but well-qualified and well-encouraged public servants.

172. Mr. *Henry Baring.*] You have spoken of the growth of the departments; can you give us any idea what that growth is from year to year; for instance, in the Treasury, you mentioned, in answer to a question from Mr. Hastie, that at present there are about 100 persons employed in the Treasury; how many were there employed, say five years ago?—The number of persons employed in the Treasury has been considerably diminished within my experience, although the work has increased.

173. Then 100 is a smaller number than you remember to have seen employed there?—I have mentioned that there are now only about 70; there were more persons employed when I first joined the Treasury, although the work has since much increased, but we have been able to reduce the number of persons employed by careful attention to the details of business, by getting rid of unnecessary business, and introducing simple and more expeditious modes of transacting that which remained; there was a great deal of business which was quite superfluous; I will mention a single instance; every patent and document of that kind used to pass through about 20 different stages, which were invented in former generations for the purpose of exacting additional fees; we got an Act of Parliament passed which reduced those 20 operations to three or four. That is a single instance; and by constantly revising our business in that manner, we have greatly reduced the time required for transacting it; and now there are fewer persons employed, and there are several unoccupied, or partially occupied rooms, at the Treasury. I do not include

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the Commissariat in these remarks, which is a separate branch of business, which has been transferred to the War Department.

174. Mr. *Edward Egerton.*] You spoke of one of these blocks of buildings being used for the Treasury; I suppose you would not contemplate moving the Treasury from its present situation?—The Treasury is very conveniently situated; it ought to be as central as possible. The main improvement as regards the Treasury, will be to bring under the same roof as the Treasury the superior revenue establishments for which the Treasury is responsible. I must carefully distinguish between that portion of the revenue establishments, which is actually employed in collecting the revenue (including part of the large establishment employed at the Custom House in London), and the superior directing offices and establishments.

175. Those are all at Somerset House?—At the Custom House and Somerset House; the Inland Revenue is entirely at Somerset House; they were partly in Old Broad-street and partly in Somerset House; now they have been concentrated, greatly to the public advantage.

176. Mr. *Stirling.*] Is there any printed return that would enable us to see what the growth of the public offices has been from year to year?—Yes, I believe I can refer the Committee to existing Returns, but, in failure of them, I have no doubt I could obtain them; there is an annual Return of the increase and diminution of public departments furnished to Parliament. But the matter can be seen with the greatest advantage by taking examples; on the one side there has been very little decrease: I could name at once the cases in which there has been a decrease. There has been a considerable decrease in some of the offices in Dublin; for instance, the Board of Works, and so forth, but the increase in other instances has been very great indeed. Take the Board of Trade; when I first became acquainted with the Board of Trade it was a single office, and that not a large one; it is now the centre of a system, including the Railway Department, the Marine Department, the Registration of Seamen, and several others. Then take the Home Office: perhaps if I submit to the Committee a particular statement of the increase in those two cases, it would afford a sufficient illustration.

177. Mr. *E. Egerton.*] Has there been an increase in the Customs and Excise?—Yes, they have been continually growing, and the same in the naval and military departments. I think that three departments will give an idea of the course which the thing is taking, the Home Office, the Board of Trade, and the Education Department. When I first became acquainted with the public offices, one of those, the Education Department, did not exist. What little was done, was done at the Council Office and the Treasury, in the distribution of a limited annual grant; now it has become a large establishment, with still larger establishments superintended by it. The Home Office in the same way was a small office, with a very limited number of clerks and a small number of inspectors; now it has spread its branches in every direction. In the same way in the Board of Trade. This is all chiefly new business; that is to say, branches of business which were not done at all before on the part of the public, are now looked after on behalf of the public; the Government has made itself responsible for them; then the growth of the army and navy establishments, with the growth of the country and the increased measures of defence required, has been very great. The constant and powerful tendency to increase, which the public establishments have shown of late years, furnishes a strong additional argument for bringing into play all the power of counteraction possible; and happily the same course of management which will check the increase of the public establishments will promote their efficiency.

See Appendix.

178. *Chairman.*] I understand you to say, that in case the Committee should recommend that there should be a concentration of the offices, and the House of Commons should approve of that recommendation, then you would recommend that a committee should be appointed from the various public offices, consisting of permanent officers of the establishments, in order to confer with the First Commissioner of Works, and to determine what shall be the relative positions of the various offices, the one to the other, in the first instance, and next the space that will be required for the various departments?—Yes; but I would not compose it entirely of permanent departmental officers. I think that it should have an infusion of Parliamentary and political officers; but that

Sir *C. E. Trevelyan*, K. C. B.

16 June 1856.

those permanent officers who are best qualified to give assistance should belong to it.

179. But still you would wish that there should be such a committee appointed, for the purpose of advising the Chief Commissioner of Works in relation to this great work?—I think the appointment of such a committee exceedingly important.

180. Then next you would desire that specifications should be founded upon the data which may be afforded by that committee, before any communications are made to architects or otherwise in relation to the structure?—Yes. I would appoint the committee at once; and I would direct them to turn their immediate attention to the War Department, with respect to which time is of great importance; and perhaps the Executive Government and Parliament would be able, as a preliminary, to determine what the situation of the War Department should be, which would greatly facilitate the matter.

181. Mr. *A. Hastie.*] What would you advise the constitution of that committee to be?—It should be composed of Members of Parliament and of political and permanent officers.

182. Mr. *E. Egerton.*] The heads of the different political departments?—Yes. It should not be too large—a large committee is very unmanageable—it ought not to consist of more than half a dozen persons. My chief view in suggesting that the committee should consist of persons belonging to different orders in the State is, that they should all be represented; that all the different public bodies concerned should go into the subject with a common feeling. I think the first step of all should be the appointment of a permanent committee to advise the First Commissioner of Works, and that their attention should be first directed to the War Department.

183. Mr. *H. Baring.*] But the first subject is the purchase of the land?—We have almost all the land which I propose should be appropriated to the War Department.

184. Mr. *Jackson.*] Would you recommend that a grant of public money should be made this Session for that purpose?—I would. I think that the public mind, especially the mind of Members of Parliament, has been so familiarised with the subject, by the discussions which have taken place since last year, that it would be advisable to provide the means of commencing previously to the next meeting of Parliament.

185. But you are not aware that the whole of the property which would be required can be obtained by consent, upon fair terms?—No, I am not certain of that; but I am sure that much the largest portion of it is Government property, and is immediately available. We should have to clear away the offices already existing there, and to make arrangements for providing them with temporary accommodation elsewhere.

186. But if that should not be found to be the case, and application had to be made to Parliament for power to take that property, no proceedings could take place until Parliament gave their sanction?—No, not as far as regards private property, without the consent of the owners of the property; but I conceive that there would be ample occupation till next Session in preparing that portion of the ground which belongs to the Government, and in laying the foundations upon it, and providing temporary accommodation for the displaced offices.

187. Mr. *Edward Egerton.*] But are not the necessities of the War Department much less pressing at the present moment, in consequence of the reduction of the establishment?—There is a reduction going on which would be very much facilitated by consolidation. It is an obvious disadvantage having a great and very important department which we have all agreed ought to be consolidated, divided into so many fragments; no other department is so situated; other departments are cut in half, but this is broken into numerous fragments, and the head is at a distance from them all.

188. Colonel *Greville.*] While the War Department is being reduced, are any additional offices required for it at this moment?—Yes; we have only just placed two additional houses at their disposal, one on the site which I propose should be permanently occupied by the War Department, and another in Spring-gardens for the use of the topographical branch of the War Department. The pressing reason for concentrating the War Department is the fact of the business being carried on in so many different places, which is a standing cause

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of inefficiency, of expense and of inferior work. It is impossible that the establishment can be reduced, or that proper arrangements can be made for the speedy and satisfactory transaction of the business, until the numerous separate offices of which the department consists are consolidated.

189. Lord *Claud Hamilton.*] Do I rightly understand you to say that you wish to bring all the business now transacted in Somerset House into the neighbourhood of the Houses of Parliament, and a great portion of that connected with the Admiralty?—The whole of it.

190, Therefore, your plan would have the effect of leaving Somerset House tenantless, as far as public offices are concerned?—Yes. If it is required for any official purpose, let it be so appropriated; otherwise let it be applied as may be most for the public advantage. It is a most valuable site, and would always be worth a great deal of money whatever use might be made of it. If it should be determined to construct the courts of law (including the Courts of Chancery, and the Admiralty, Ecclesiastical, and Testamentary jurisdictions) upon the site of Somerset House, it might be done out of the surplus unused legal deposit funds. The existing buildings at Somerset House would afford convenient accommodation, in immediate proximity to the courts, for the Judges' chambers, Masters' offices, Registries of Wills and Judgments, and other legal offices. The old Ordnance Office in Pall Mall, the houses adjoining to it, which have been recently purchased for the War Department, and many houses in St. James's-square, Whitehall-place, and elsewhere, which are at present occupied as public offices, would also become available in diminution of the expense of the plan, besides the numerous and valuable buildings in Chancery Lane and elsewhere, which are at present appropriated as legal offices.

191. With respect to the Stamps and Taxes, and departments of that sort, is there any great advantage in having them close to the Houses of Parliament?—There is great advantage in having them in connection with the superintending office, the Treasury. The steps of the argument are these: the superintending offices must be in the neighbourhood of Parliament, and the superintended offices must be in the neighbourhood of the superintending offices.

192. Mr. *A. Hastie.*] Is there much communication between the Treasury and the Inland Revenue Office?—Yes, constantly; you may see it stated daily in the "Times," that Sir Thomas Fremantle, Mr. John Wood, and other gentlemen have been wasting their time in going to and fro between the Custom House and Somerset House and the Treasury; and then there is the correspondence, a great part of which would be saved; the clerks who are now employed in carrying on that voluminous correspondence, giving full details of everything, might be reduced, or be employed on really useful business. The principle on which we proceed is, that every thing comes up to us complete, fully stated, like a lawyer's brief. In the majority of cases, a few words, or at most ten minutes' conversation, would prevent all that; and then we should become familiarly acquainted with the business, and they would know what our wishes and intentions were. Above all, we should obtain such knowledge of the establishments superintended by us that we should be able to select the ablest of the officers possessed of practical experience of the different branches of the revenue to fill the permanent situations at the Treasury, without which the security for good administration which arises from efficient superintendence, cannot exist.

193. You think that a large proportion of the correspondence which now takes place from you to the Inland Revenue Office and back to you would be saved, if that department were brought close to the Treasury?—Yes; it is interesting to observe, that while we are slowly and laboriously arriving at satisfactory administrative results, on the principle of induction from experience, suffering much loss and inconvenience in the meantime, the French have taken a short cut on the *à priori* principle, and have reasoned out just symmetrical models, towards which we are gradually attaining.

Veneris, 20° *die Junii*, 1856.

MEMBERS PRESENT.

Sir Benjamin Hall.	Mr. Edward Egerton.
Mr. Jackson.	Earl Grosvenor.
Lord Claud Hamilton.	Mr. Henry Baring.
Mr. Archibald Hastie.	Mr. Ker Seymer.
Mr. Stirling.	Mr. Disraeli.

THE RIGHT HON. SIR BENJAMIN HALL, BART., IN THE CHAIR.

Henry Arthur Hunt, Esq., called in; and further Examined.

H. A. Hunt, Esq.
20 June 1856.

194. *Chairman.*] DO you wish to make any further statement to the Committee?—I wish to inform the Committee that in my estimate of 1,500,000 *l.* I did not include the part which is edged with blue upon this plan, which Parliament has already given powers to the Office of Works to take.

195. You allude to the powers given under the Act of last Session, which authorises the sum of 30,000 *l.* to be raised for the purpose of acquiring the property inclosed in the blue lines upon that map?—Part of the property inclosed in the blue lines. Nor have I taken in my estimate any account of the property which at present belongs to the Government, the vacant ground in Fludyer-street, and the Foreign Office; I have only included the property that we shall have to acquire. I have not put into my valuation the buildings now occupied by the Foreign Office, the Chancellor of the Exchequer, the Colonial Secretary, and the First Lord of the Treasury.

196. Then the Committee are to understand, that for 1,500,000 *l.* you believe that we shall be able to acquire all the property from the back of Richmond-terrace, and Downing-street on the north, to Great George-street and Westminster Hall on the south, and from the Thames on the east, to the Park on the west, exclusive of the property which is to be acquired under the Act of last Session, and exclusive also of the property which at present belongs to the Government?—That is so.

197. Mr. *Jackson.*] What addition would it make to the 1,500,000 *l.*, supposing you had to begin *de novo*, and to make the purchases to which you have alluded, which have been already provided for by the grant from Parliament?—That is only 30,000 *l.*; that is a very small portion of the whole.

Veneris, 18° *die Julii*, 1856.

MEMBERS PRESENT.

Sir Benjamin Hall.	Mr. Jackson.
Mr. Archibald Hastie.	Mr. Stirling.
Mr. Henry Baring.	Colonel Greville.

THE RIGHT HON. SIR BENJAMIN HALL, BART., IN THE CHAIR.

Henry Arthur Hunt, Esq., called in; and further Examined.

H. A. Hunt, Esq.
18 July 1856.

198. *Chairman.*] WHAT is the rental of the houses now occupied as offices for the Public Services, and which are held on lease?—Twenty-two thousand pounds a year.

199. To afford the same accommodation by public buildings, supposing they were erected three stories in height, what area would be required?—They would occupy an area of 171,638 square feet, exclusive of open spaces.

200. If the business of the Admiralty, which is now carried on at Somerset House, was removed to Whitehall, what additional space would be required?—Forty-two thousand six hundred square feet.

A P P E N D I X.

Appendix, No. 1.

PAPERS delivered in by Sir *C. E. Trevelyan*, K.C.B. Appendix, No. 1.

RESULTS of the Consolidation of the PAY OFFICE ESTABLISHMENTS in London.

THE savings from the consolidation of establishments employed in London in making payments on the public account up to 1839, amount to 22,726 *l.* per annum, as shown on the 4th and 5th pages of the Parliamentary Paper, No. 359, Sess. 1841.

In 1848 a further saving in numbers of 35 persons, and in salaries of 16,145 *l.* per annum, was made, on the occasion of the consolidation of the two offices of Paymaster of Civil Services and Paymasters of Exchequer Bills with the office of Paymaster-general; *see* paragraph 152 of the Treasury Minuute, dated 22d December 1848, presented to both Houses of Parliament by Command of Her Majesty, No. [1041] of 1849.

And in 1855 a saving of 700 *l.* a year was made by the abolition of the office of Bill Clerk at the Treasury, the duties of which were transferred to the Paymaster-general's office.

The total savings from the consolidation of Pay-office establishments is therefore 39,571 *l.* per annum, irrespective of the office accommodation, and expense of printing, stationery, and other contingent charges saved by the last consolidation.

Besides the saving in office establishments, there are two other important sources of economy connected with these consolidations; that is,

1st. The saving of the interest of money by consolidating the balances, or, in other words, by making the public payments from a single, instead of from numerous balances. In the Parliamentary Paper, No. 359, 1841, relating to the Paymaster-general's office, to which reference has already been made, Sir Henry Parnell took credit for an annual saving of 6,300 *l.* under this head, and since that time this kind of economy has been carried much further. Owing to the improved system of managing the public balances, which has been introduced in consequence of these consolidations, the whole of the public payments are now made from a smaller average balance than was formerly kept in each of the separate pay offices, and,

2dly. The saving arising from the facilities which a consolidated establishment furnishes for transacting a larger proportionate amount of business. The amount of cash payments made in the Paymaster-general's office in 1839–40 (irrespective of transfers between services) was 13,600,000 *l.*; whereas in 1855–56 the amount (exclusive of the Turkish loan, which was merely passed through the accounts for transmission to Constantinople) was 106,000,000 *l.*

Besides the larger consolidations above described, constant transfers to the Paymaster-general's office have taken place of Civil Service and other payments previously made by the chief clerks and others in different departments, whereby increased security and public convenience have been obtained, with some saving of highly paid agency in the executive departments, and without any increase of establishment in the Paymaster-general's office.

Treasury, 18 June 1856. *C. E. Trevelyan.*

Appendix, No. 1.

COMPARISON of the ACCOMMODATION required for the BOARD of TRADE, the HOME OFFICE, and the EDUCATION COMMITTEE of the PRIVY COUNCIL in 1840 and 1856.

BOARD OF TRADE AND DEPENDENT OFFICES.

	Numbers.	Locality.
1840:		
Board of Trade	28	
Registry of Merchant Seamen (then under the Admiralty)	23	
Registry of Designs	4	
	55	
1856:		
Board of Trade	82	
Registry of Merchant Seamen	49	Adelaide-place, London Bridge.
Registry of Designs	9	1, Whitehall.
Registry of Joint Stock Companies	8	13, Serjeant's Inn, Fleet-street.
	148	

The large establishments which have their head quarters at Marlborough House and in Jermyn-street, for which provision has been made to the extent of 64,675 *l.* for the year 1856-7, at p. 6 of the Fourth Class of the Civil Service Estimates, are also under the superintendence of the Board of Trade; but it is proposed to transfer them to the Committee of Council for Education.

Further particulars relating to the accommodation required for the Board of Trade will be found in the accompanying copy of a letter from the Secretary to the Board of Trade to the Office of Works.

Office of Committee of Privy Council for Trade,
Whitehall, 9 May 1856.

Sir,

I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 21st ultimo, requesting, on behalf of the First Commissioner of Works, &c., to be furnished with a statement showing the number and size of the several apartments at present occupied by this department, and whether any increased accommodation is desired, and if so, to what extent. In reply, I am directed to transmit to you herewith, for the information of Sir Benjamin Hall, the accompanying returns of the number and size of the different rooms in the various buildings occupied for the purposes of the Board of Trade and its subordinate departments, viz.: the Board of Trade proper in Whitehall; the Statistical, Corn, and Meteorological Departments in Parliament-street; the Registrar of Designs Office at 1, Whitehall; and the Registrar of Joint-Stock Companies' Office in Serjeant's Inn; the whole of which my Lords consider it would be most desirable to unite together in one building, the present separation being found productive of serious inconvenience to the public service.

It will appear from these Returns that the extent of accommodation at present provided in the different buildings is as follows:

	Number of Rooms.	Space.
		Square Feet.
Board of Trade	43	10,959
Meteorological Department	15	3,094
Statistical and Corn Department	13	3,429
Designs Office	12	3,061
Joint Stock Companies' Office	6	1,738
TOTAL	89	22,281

Together with domestic offices in proportion.

The

The additional accommodation required by the Meteorological Department and the Joint Stock Companies' Office, to the extent of 900 and 487 square feet respectively (as shown in the Returns), increases this total to 23,668 square feet.

The constant increase of business in the Board of Trade proper, the corresponding additions made to the staff of persons employed in it, and its present overcrowded state, will render necessary a considerable addition to the space which it now occupies, and in the event of the proposed scheme for concentrating the public offices, as mentioned in your letter, being carried into effect, my Lords consider that a space of not less than 30,000 square feet should be appropriated to the Board of Trade and its subordinate departments, with, of course, a corresponding provision for domestic offices, &c.

I have, &c.

Alfred Austin, Esq. (signed) *James Booth.*

HOME OFFICE AND DEPENDENT OFFICES.

	Numbers.	Locality.
1840:		
Home Office	38	
Office for Drawing Bills	4	
Convict Hulk Establishment	2	
Inspectors of Factories, &c.	20	
Inspectors of Anatomy	3	
Signet Office	10	
	77	
1856:		
Home Office	39	
Office for Drawing Bills	4	New-street, Spring Gardens.
Convict Prisons Office	18	45, Parliament-street.
Inspectors of Factories, &c.	21	Home Office.
Inspectors of Anatomy	3	York Buildings, Adelphi.
Turnpike Roads Office	3	Home Office.
	88	

The following offices also act in subordination to the Home Office:

Irish Office	10, Whitehall.
Lord Advocate	Spring Gardens.
Poor Law Board; established in 1834	Gwydir House.
Lunacy Commissioners; appointed in 1845	19, Whitehall-place.
Copyhold, Inclosure, and Tithe Commission; gradually formed from 1836 to 1846	3, St. James's-square.
Registrar-general of Births, Deaths, and Marriages; established in 1836	Somerset House.
National Vaccine Establishment	8, Russell-place.

EDUCATION COMMITTEE.

The recent growth of this important office is fully described in the accompanying interesting memorandum by Mr. Lingen.

In 1840 the business was done by an assistant secretary and a subordinate clerk, with the help of two of the clerks on the establishment of the Council Office.

The separate Education establishment now consists of 50 permanent officers in London and 41 inspectors, besides 10 or 15 law stationers' clerks employed in extra copying.

Treasury,
18 June 1856.

C. E. Trevelyan.

Appendix, No. 1.

EDUCATION COMMITTEE OF THE PRIVY COUNCIL.

THE establishment was not organised independently of the Council Office until the end of 1853.

It now consists of 50 permanent officers in London, and 41 inspectors.

Supernumerary clerks, to the number of 10 or 15, are generally in employment for extra copying.

The annexed letter to the Board of Works will explain the present accommodation of the office (A).

The department has necessarily grown with the grant which it has had to administer.

The grant voted for Education was in—

	£.		£.
1839	30,000	1848	125,000
1840	30,000	1849	125,000
1841	40,000	1850	125,000
1842	40,000	1851	150,000
1843	50,000	1852	160,000
1844	40,000	1853	260,000
1845	75,000	1854	263,000
1846	100,000	1855	396,921
1847	100,000	1856	451,213

The corresponding increase of the work may be judged of from the following table of results (during each of the last five years):—

Years ending 31 Dec.	Number of School Buildings Erected, Enlarged, or Improved.	Number of Pupil Teachers.	Number of Queen's Scholars.	Number of Students in Training, Examined, and Passed.	Number of Certificated Masters and Mistresses.	Number of Inspectors*	Number of Schools (under separate Teachers) Inspected*.	Number of Children present at Examination.
1850–1	285	4,660	39	205	980	19	3,098	214,873
1851–2	205	5,607	144	305	1,173	19	3,114	256,888
1852–3	232	6,180	331	526	1,720	22	3,934	354,442
1853–4	273	7,007	783	833	2,297	29	4,341	360,777
1854–5	312	7,768	929	1,132	2,836	32	5,575	473,214
1855–6	414	8,524	972	1,254	3,432	36	6,966	569,076

* Exclusive of five workhouse school inspectors and upwards of 600 workhouse schools.

With regard to the minute and complicated character of the administration which has to be conducted, the following is the Report of the Commissioners appointed to organise the establishment in 1853 (Parliamentary Blue Book, p. 234):

"There is no department of the Government into which more elaborate mechanism is introduced than the Office for Education. Grants in aid of schools are made to all applicants on their compliance with certain conditions. As the number of the applications can never be known beforehand, the amount to be taken in the annual vote can only be estimated according to the experience of past years; and when the money has been voted, as the award of grants has to be made by anticipation, and payment follows at varying intervals (sometimes as much as two years) according to the nature of the conditions to be fulfilled, a strict watch must be kept over the expenditure, in order to secure the department against the risk of incurring liabilities beyond its means. It is also necessary to distinguish the purposes for which each several grant is made, so as to render it as useful as possible; for it would be undesirable to place a sum of money in the hands of the promoters of a school, merely as a grant in aid of their contributions, without ascertaining the particular uses to which it is to be applied. Further, it is essential to the system upon which the State acts with reference to education, that the grant made in each case should depend upon the exertions of those who receive it; and that the department charged with its administration should satisfy itself, by means of well-regulated inspection, that it is applied to the best advantage. Such inspection has to be conducted by gentlemen appointed with reference

reference to the requirements of different religious denominations; yet the whole must be directed upon harmonious principles. A central department can only carry on the direction of so complicated a system by the aid of very perfect machinery; and when it is borne in mind that the amount of the grant to be administered is now no less than 260,000 *l.*; that there are 25 inspectors' districts; 5,509 schools subject to inspection, of which 2,466 must be inspected every year, and the others as frequently as can be arranged; 2,875 certificated masters and mistresses, of whom 2,200 are receiving annual additions to their salaries; and 6,180 pupil teachers in the receipt of salaries from the Government, and consequently subject to annual examinations; that from 800 to 900 sets of books and maps are annually distributed; and that aid is given towards the building of nearly 300 schools a year; it will readily be perceived that great care and constant attention are necessary to prevent confusion, and to carry on the business in a proper manner."

These numbers, which relate to the year 1852, are all considerably increased, as the preceding Table shows, at the present time.

It only remains to trace the growth of the department up to 1853.

It began in 1839, by the appointment of Sir James Kay Shuttleworth (then Dr. Phillips Kay) as Assistant Secretary to the new Committee of the Privy Council, the word "Assistant" having reference to the Clerk of the Council. At the same time, two of the Council-office clerks were assigned to education business, and one assistant clerk (not on the establishment) was appointed.

From 1839 till July 1847, the education establishment in London was increased only by drafting additional clerks from the Council-office, and by appointing more supernumeraries.

In 1847, two officers were appointed under the name of "Examiners," independently of the Council-office establishment, in order to administer the grants which then began for the first time to be made towards the annual support of schools, and which involve, in various forms, the principle and practice of examination as regards both teachers and scholars.

The examiners in 1853 had increased to four, and at that time the complication arising from the heterogeneous organisation of the department had become so embarrassing, that the whole was revised and consolidated, the examiners being taken as the type of the superior order of clerks, under a secretary and two assistant secretaries, and the supernumeraries being put on the establishment and grouped into a regular order for promotion. Thenceforth the education establishment has existed independently of any other office, except in its subordination to the Lord President.

The growth in the number of the inspectors from year to year is made curiously visible to the eye by the shape which the entries assume in a Table at p. 28 of the House of Commons Paper, No. 103, Session 1851.

R. R. W. Lingen,
17 June 1856. Secretary.

LETTER (A.) referred to in preceding Memorandum.

Committee of Council on Education,
Council Office, Downing-street, London, 2 May 1856.

OFFICE ACCOMMODATION.

Sir,

IN reply to your letter of the 21st ultimo, I have the honour to state that the establishment of the Education Committee of the Privy Council at this time comprises 60 persons employed in writing, and that at particular seasons this number has to be considerably increased.

1. Present Accommodation:

The establishment occupies parts of the four stories in the southern end of the Government buildings which face Whitehall; viz.,

On the ground floor, two rooms, occupied by the architect of the Committee of Council and his clerk.

On the first floor, three rooms; viz., one large room occupied by myself, one fairly-sized room occupied by one of the assistant secretaries, and one very small room occupied by the Lord President's private secretary.

The Lord President's own room is on this floor, and the education department makes partial use of three other rooms when the Judicial Committee of the Privy Council, to which the rooms belong, is not sitting.

On the second floor, 11 rooms, occupied by 34 persons; some of the rooms being excessively crowded, and three only, one of which is very small, being occupied as single rooms.

Appendix, No. 1.

On the third floor, four rooms, occupied by 20 persons; two of the rooms being excessively crowded, both with clerks and with papers.

2. Future Accommodation:

The establishment is organised with the Lord President at its head, under a secretary and two assistant secretaries.

Each of these gentlemen has a large amount of correspondence and of administrative details to superintend, and a great number of visitors to see daily. The business of the office indispensably requires that each of them have a separate room of good size.

Three separate rooms.

The Lord President desires me to add specially, that, considering the number of visitors of all descriptions who have business to transact with so many officers of the department, it is desirable to have at least two waiting rooms, or one large Board room and one waiting room.

Next to these three gentlemen is a body of superior officers (at present eight in number) called examiners, among whom the correspondence and business of the office is divided under the two assistant secretaries. The correspondence involved the receipt of upwards of 30,000 separate letters (without counting enclosures) during the past year. The number of examiners will probably have to be increased, and suitable accommodation for at least 10 such officers should be provided. Four separate and two large rooms would afford the most convenient mode of arranging them.

Four separate and two large rooms.

Four rooms, to hold eight in each.
Two rooms, to hold six in each.
Five rooms, to hold three in each.

The rest of the clerks, allowing for such increase in the number as the growth of the grant for education will almost immediately render indispensable, would be best grouped in four rooms, to hold eight in each; two rooms to hold six each; and five rooms to hold three each (or other accommodation for 15 persons).

One room, and small one communicating.

The architect will continue to require a fair sized room for himself, and a small one for his clerk, communicating with it.

Large room, and small one communicating with it.

A Bill has passed the House of Lords for appointing a Vice-President of the Education Committee, and if that Bill becomes (as it doubtless will) law, that officer will need a large room for himself, and a smaller one for a private secretary.

The result gives 24 rooms, of which nine should be very large ones.

Seven rooms, to be replaced if department removed from present buildings.

It must be borne in mind, that if the education department be located separately from the Council-office, the rooms (two) now used for messengers, the rooms (three) occupied when the Judicial Committee is not sitting, the Lord President's own room, and that of his private secretary must be replaced.

Examinations on a large scale, comprising between 2,000 and 3,000 candidates, and nearly 20,000 separate papers, are simultaneously held in 30 or more different places throughout the country in December of each year. The details of preparing for and of sorting and revising the papers of this examination require the use of two large rooms not reckoned in the foregoing number from 1 November to 31 March; two rooms have hitherto been hired for the purpose in Great George-street, Westminster.

The Order in Council of 25 February last provides for the amalgamation of the Department of Science and Art with this department so far as to place both under the control of the Lord President of the Council and a Vice-president. The order also adds a variety of duties to those at present discharged by this department. No steps have been taken at present to give practical effect to this order, but it may be mentioned that the consolidation of departments occupying premises which do not directly communicate is thereby rendered difficult.

I have, &c.

Alfred Austin, Esq., &c., &c., &c.,
Office of Works, &c.

(signed) *R. R. W. Lingen.*

ACCOUNT of Sums granted by Parliament for the Construction of the New Stationery Office and the General Repository for the Public Records, and of the Expenditure therefrom.

STATIONERY OFFICE.

VOTES.	£. s. d.	EXPENDITURE.	£. s. d.
1852–53:		1852–53: Nil	—
To Amount voted for the year 1852–53 - (Class I.)	10,000 - -	1853–54:	
1853–54:		By Works - - - - - - - - -	5,300 - -
- Ditto - - ditto - - 1853–54 - „	10,000 - -	- Architect's Commission on Account - - -	200 - -
1854–55:		1854–55:	
- Ditto - - ditto - - 1854–45 - „	10,000 - -	- Works, &c. - - - - - - - -	16,020 - -
1855–56: Nil - - - - - - - -	—	- Salary and Disbursements of Clerk of Works -	233 9 -
1856–57: Nil - - - - - - - -	—	1855–56:	
		- Works, &c. - - - - - - - -	4,089 - 8
		- Salary of Clerk of Works - - - -	164 6 6
		- Architect's Commission - - - -	500 - -
		- Compensation to Tenants for surrender of Premises - - - - - - - -	150 - -
		1856–57:	
		- Works, &c. - - - - - - - -	1,019 9 4
		- Salary of Clerk of Works - - - -	53 8 -
		- Architect's Commission - - - - -	600 - -
		£.	28,329 13 6
		Balance in the hands of the Paymaster-general - £. 1,673 13 8	
		Less Amount due to the Commissioners of Inland Revenue for Income Tax not paid over - - - 3 7 2	
			1,670 6 6
£.	30,000 - -	£.	30,000 - -

Note.—The Expenditure for this Service is completed, with the exception of a probable Balance of 21*l.* 8 *s.* 6 *d.* due to the Architect.

Office of Works, &c.
19 June 1856.

Joseph Bedder,
Chief Examiner.

GENERAL REPOSITORY FOR PUBLIC RECORDS.

VOTES.	£. s. d.	EXPENDITURE.	£. s. d.
1850–51:		1850–51:	
To Amount voted for the Service of the year 1850–51 - - Class 1	30,000 - -	By Works - - - - - - - - -	500 - -
1851–52:		1851–52:	
- Ditto - - ditto - 1851–52 - - „	7,000 - -	- Works - - - - - - - - -	11,199 19 9
1852–53:		- Salary of Clerk of Works - - - -	122 2 1
- Ditto - - ditto - 1852–53 - - „	8,320 - -	1852–53:	
1853–54: Nil.		- Works - - - - - - - - -	10,971 7 -
1854–55:		- Salary and Disbursements of Clerk of Works -	171 15 2
- Amount voted for the Service of the year 1854–55 - - „	10,000 - -	- Tithe Rentcharge, Rates, and Police - -	34 16 10
1855–56: £.		1853–54:	
- Ditto - - ditto - 1855–56 Class 1, 6,000 / Class 7, 9,000	15,000 - -	- Works - - - - - - - - -	7,500 - -
£. 15,000		- Architect's Commission, 1,100*l.*; Law Expenses, 50*l.* - - - - -	1,150 - -
1856–57:		- Salary and Disbursements of Clerk of Works -	169 19 9
- Ditto - - ditto - 1856–57 - - Class 7	9,000 - -	- Miscellaneous Payments - - - -	94 19 11
		1854–55:	
		- Works, &c. - - - - - - - -	6,559 3 -
		- Salary and Disbursements of Clerk of Works -	168 9 -
		- Miscellaneous Payments - - - - -	145 - 8
		1855–56:	
		- Works - - - - - - - - -	12,269 11 4
		- Clerk of Works, Salary and Disbursements -	170 19 10
		- Architect's Commission - - - - -	500 - -
		- Miscellaneous Payments - - - - -	218 - 8
		1856–57:	
		- Works - - - - - - - - -	2,250 - -
		- Clerk of Works, Salary and Disbursements -	41 2 2
		- Miscellaneous Payments - - - - -	21 18 -
		£.	54,259 5 2
		Balance now available - - £. 25,063 9 5	
		Less Amount due to Commissioners of Inland Revenue for Income Tax not paid over - 2 14 7	
			25,060 14 10
£.	79,320 - -	£.	79,320 - -

Works are still in progress.

Office of Works, &c.,
19 June 1856.

Joseph Bedder,
Chief Examiner.

Appendix, No. 2.

Appendix, No. 2. LETTER from *H. R. Drewry*, Esq., to *A. Austin*, Esq., Secretary to the Commissioners of Works, &c.

Sir, War Department, Pall Mall, 28 June 1856.

In reply to your letter of 25th instant, I am directed, in accordance with the request contained therein, to transmit for the information of the First Commissioner of Works, the enclosed statement, showing the number of houses now occupied by the War Department, and the number of occupants to whom accommodation is afforded therein; and I am to observe, that this information has already been communicated to the Lords Commissioners of Her Majesty's Treasury, in a letter dated 12th instant.

I am, &c.
(signed) *H. R. Drewry.*

COPY STATEMENT.

	NUMBER OF OCCUPANTS.
1. Whitehall-gardens	53
2. Ordnance Office	166
3. Buckingham House	79
4. No. 90, Pall-mall	10
5. Whitehall-yard	10
6. Army Medical Department	10
7. Chaplain-general, Whitehall	2
8. War Department, Horse Guards	86
9. Ditto - - Craig's-court	52
10. No. 88, Pall-mall	10
11. No. 89, ditto	20
	498

REPORT

FROM THE

SELECT COMMITTEE

ON

PUBLIC OFFICES

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE,

MINUTES OF EVIDENCE,

AND APPENDIX.

Ordered, by The House of Commons, *to be Printed*,
18 *July* 1856.

368.

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